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FINAL ISSUE
PROCESS ENGINEERING

From: T. Y. Tam
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VISTA

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Subject: LCVCM T-544. PROCESS RUNOFF DIVERSION TANK
OPERATING MANUAL

Attached is the operating manual for the new process runoff diversion tank T-544. This operating manual is intended to provide basic flow logic and general operating philosophy of the new T-544.

If you have any questions or comments, please call me at 5077.

Tommy Tam

Tommy Tam
Process Engineer

Distribution : RAC-PEM-GEH-WPS-JGC-SCR-ERT-PE-SS(4)

CWH 000009638

LAKE CHARLES VCM PLANT

PROCESS RUNOFF DIVERSION TANK

T-544

OPERATING MANUAL

CWH 000009639

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INTRODUCTION

The water treatment at the VCM plant is presently divided into four sections:

1. The incinerator water and C-500 water is neutralized by the acid neutralization tanks before it discharges into the secondary.

2. Water generated or used in the process that contains VCM or EDC is steam stripped in C-101/101A before discharge to T-500. Therefore, the VCM content is below 10 ppm (as required by NESHAP regulations) and EDC content is minimized.

3. Process area runoff water is often contaminated with EDC as a result of unpreventable spills and miscellaneous fugitive discharges that could not be handled by the closed process sewer system or the mobile recovery pot system. It is collected by trenches and flows into T-500, an old acid neutralization tank, where the process area runoff water, without being treated of EDC, combines with the steam stripper bottoms and flows into the secondary. (Figure 1.)

4. The secondary treats all of this wastewater to remove biodegradable organic chemicals.

In order to comply with the NPDES permit and other future regulations, EDC content must be reduced substantially before going into the secondary. Therefore, the old T-2, which was previously used for EDC settling from the process runoff, is replaced by a Furan tank, T-544 (Figure 2).

This will satisfy a commitment made with the Louisiana Department of Environmental Quality, under which T-2 classification was changed from the more stringently regulated surface impoundment to the subsurface tank status.

Attachment 1
T-544/Process Trenches/T-2/T-1
New Operating Rules

Environmental regulations require the new T-544, process trenches, T-2, and T-1 to be operated quite differently than in the past. It is very important that the operating rules below are followed to prevent exceedances of the plant wastewater permit, to allow the plant to meet commitments made to the DEQ regarding T-1 and T-2, and to allow the plant to comply with future anticipated regulations:

T-544/Process Trenches:

- Rule #1: T-544 is to only collect normal process trench water and unpreventable spills of EDC to grade. The closed process sewer system, mobile recovery pot, frac tanks, etc. are to continue to be used whenever possible instead of draining materials to the process trenches.
- Rule #2: The material collected in T-544 is always to be steam stripped except during special circumstances. Consult the Environmental Coordinator for criteria for exceptions.
- Rule #3: Water streams to the process trenches are to be minimized to prevent excessive energy costs, overloading the steam stripper, etc.

T-2:

- Rule #1: T-2 is not to be used to collect any process waste streams. It is only a containment tank for T-544 in the event of a leak, and to allow inspection and repair of T-544.
- Rule #2: Rainwater or T-544 leakage collected in T-2 must be emptied promptly, daily if necessary.

T-1:

- Rule #1: T-1 is to only collect process area rainwater runoff. No other streams are to be pumped or drained into T-1.
- Rule #2: After rainwater runoff has collected in T-1, it must be emptied as soon as possible (to the appropriate location, based on sample analysis and guidelines in the T-544 Operating Manual). In no event is the material collected to remain in the tank more than 90 days.

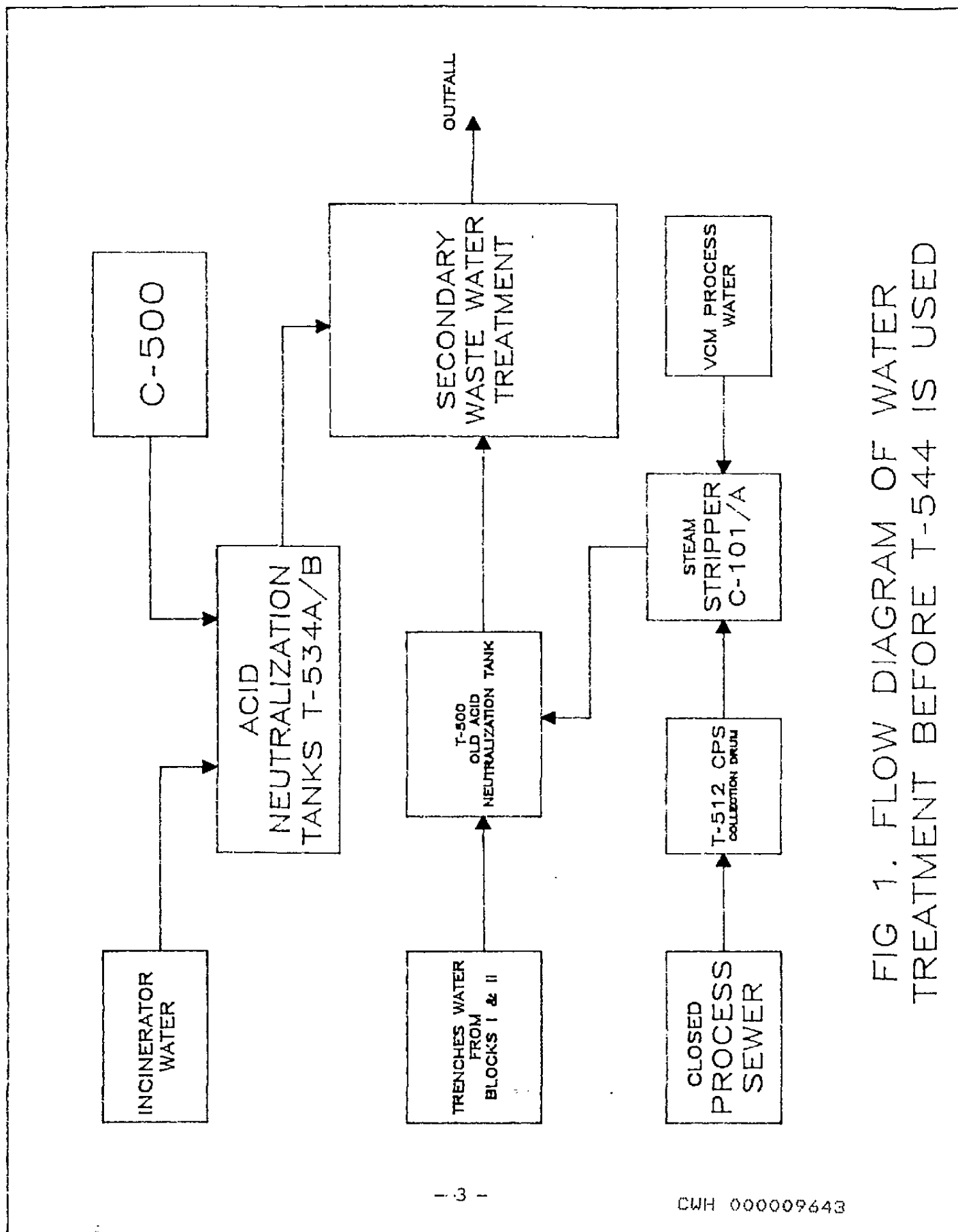


FIG 1. FLOW DIAGRAM OF WATER TREATMENT BEFORE T-544 IS USED

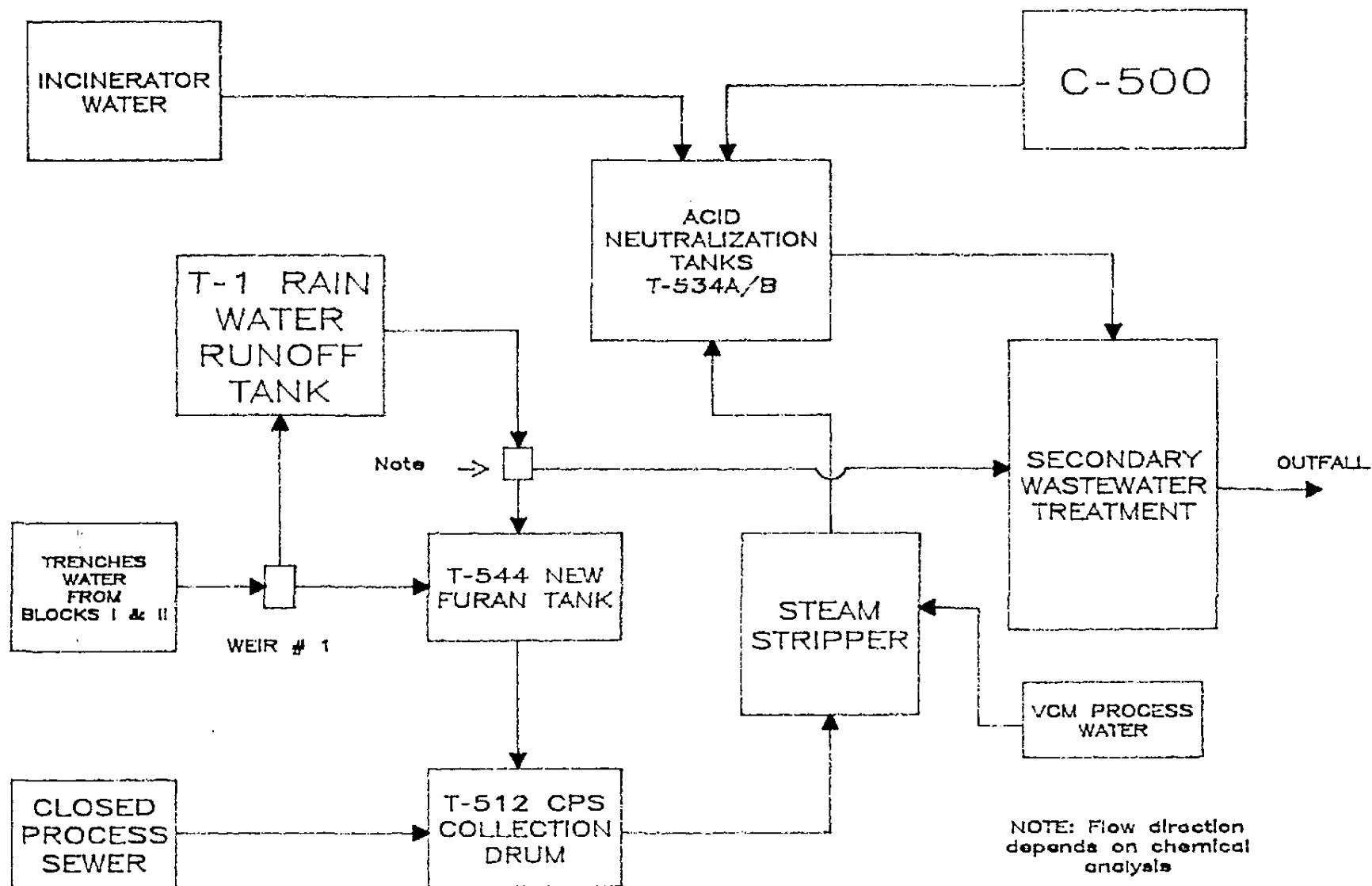


FIG 2. FLOW DIAGRAM OF WATER
TREATMENT WITH T-544 IN USE

PROCESS DESCRIPTION

A. OVERALL OPERATION

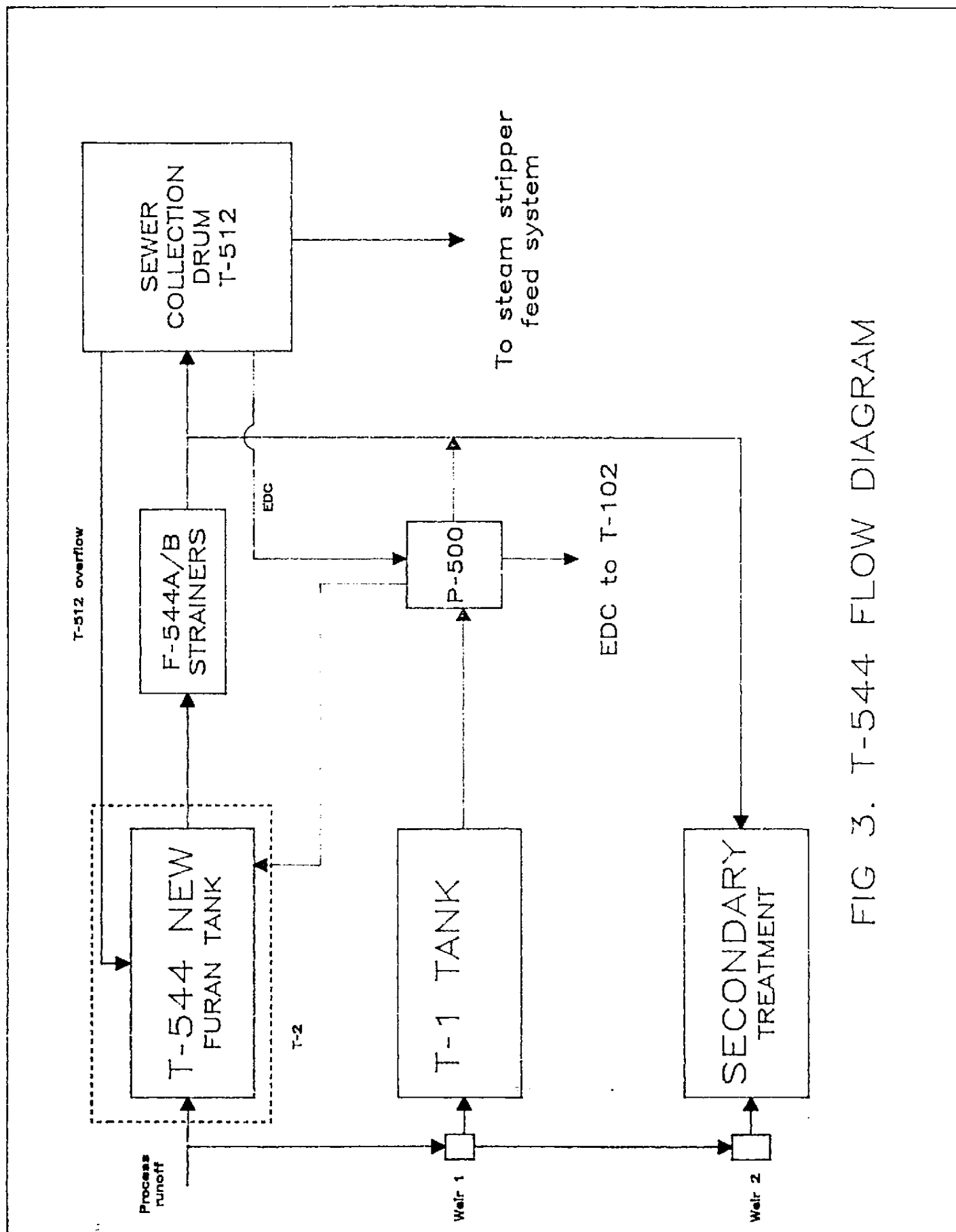
The EDC contaminated process area runoff water from Blocks I and II collected by T-544 will be pumped to the closed process sewer collection drum, T-512, and eventually to the Steam Stripper, C-101/A, (Figure 3). Two diversion weirs will handle excessive water flow to T-544 caused by heavy rainfall. The first weir, (Figure 6), diverts water in excess of 100 gpm to T-1 which acts as a 90 day rainfall collection tank. This will reduce the possibility of EDC being discharged into the secondary during a heavy rain. The second weir, (Figure 7), allows overflow to secondary treatment when T-1 is full. By this time, it is assumed that almost all the EDC in the process trenches will have been flushed out to T-544 or T-1 by the rain.

B. T-544 Transfer to T-512

T-544 is equipped with two sump pumps, P-544A and P-544B (Figure 5). One of the pumps will operate automatically and the other one will be a standby. The pump-out rate is controlled by level control valve LCV-574A. A 10 gpm permanent recirculation is provided to avoid deadheading the pump. Should the level drop below 20 %, 15 inches in T-544, the switch, LSL-574, will shut off the pump automatically. It will restart when the level rises and trips on the high level switch (LSH-574B Figure 8). Both pumps have a 3 mesh suction screen to block out large particles. The pump transfers liquid to T-512 through the strainer, F-544A or F-544B. Rupture discs RD-544A/B are set at 100 psig and are located immediately upstream to protect the strainers. Both rupture discs discharge into T-544.

C. T-512 TRANSFER TO STEAM STRIPPER

The aqueous layer will be pumped to the steam stripper feed system, T-110, by P-512A/B and P-503. A restriction orifice (RO) is installed to reduce the maximum flow rate from 150 gpm to 80 gpm and the pressure from 75 psi to 8 psi. The pump out rate is controlled by the level control valve (LVC-574A) which will be shut off in case of a high level in T-110. The organic layer at the bottom that contains EDC will be pumped to T-102 or T-103 by P-500. There is a 4" overflow line connecting T-512 to T-544. The 6" rupture disc discharge line also leads the flow back to T-544.



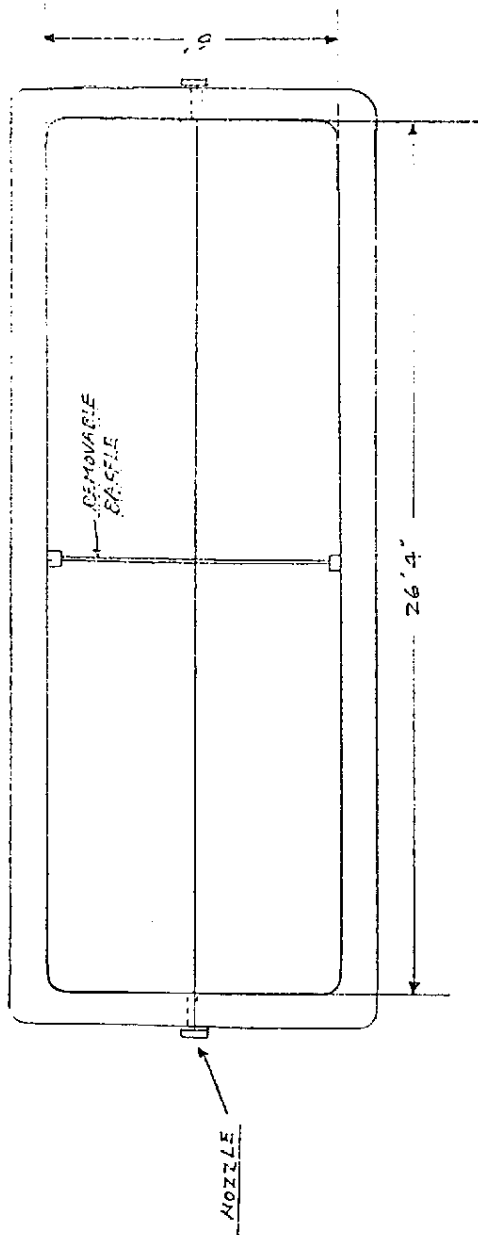


FIG 4a. PLAIN

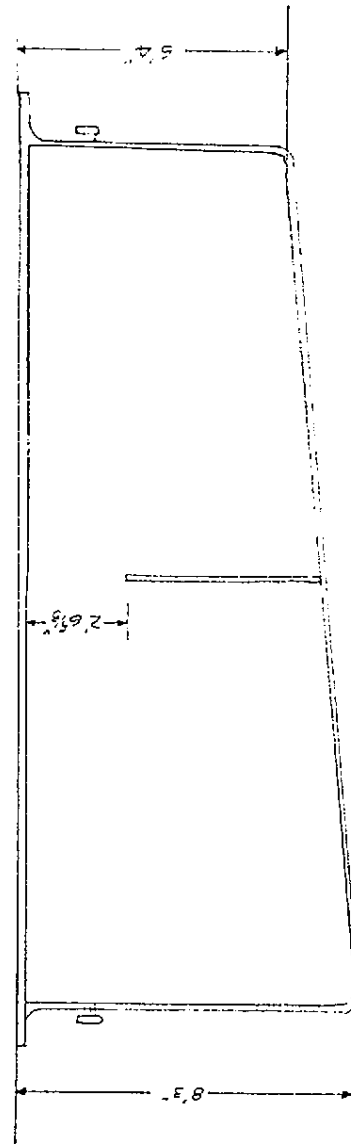
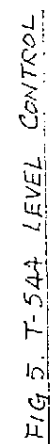


FIG 4b. ELEVATION

FIG 4. T-544 FURNACE



D. T-1

During heavy rains, T-544 will be filled until the trench water level rises high enough to overflow the first diversion weir (Figure 6), which is 10" high, into T-1. Whenever T-1 accumulates water, it must be emptied within 90 days to retain the 90 day tank classification. Sample analysis is required to determine the EDC concentration of the liquid before transfer. Transferring from T-1 to T-544 when EDC content is higher than 100 ppm or to the secondary when EDC content is lower than 100 ppm.

Since the top of T-544 is about 6" higher than the top of the collection trench, T-544 should not overflow into T-2, but rain water may accumulate in T-2. A 1 1/2" pipe from the bottom of T-2 to P-500 is provided such that the accumulated rain water can be pumped out of T-2.

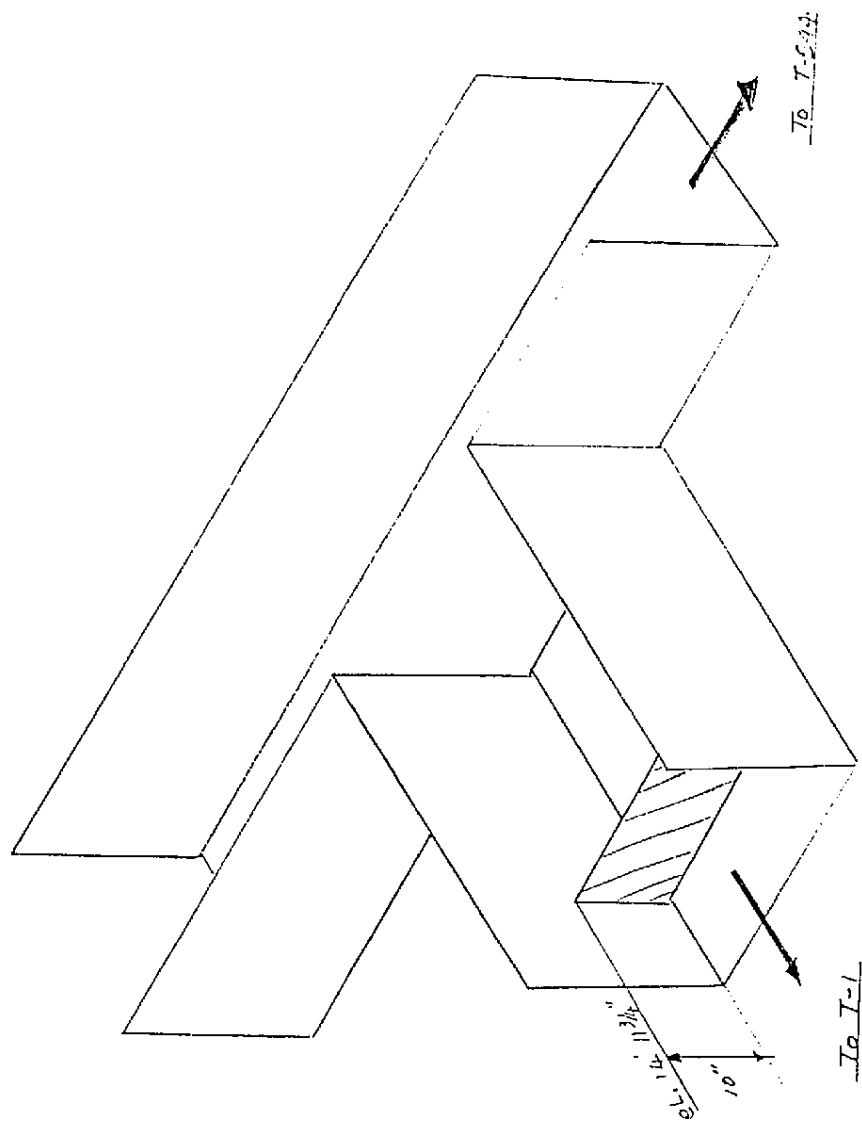


FIG 6 FIRST DIVERSION WEIR

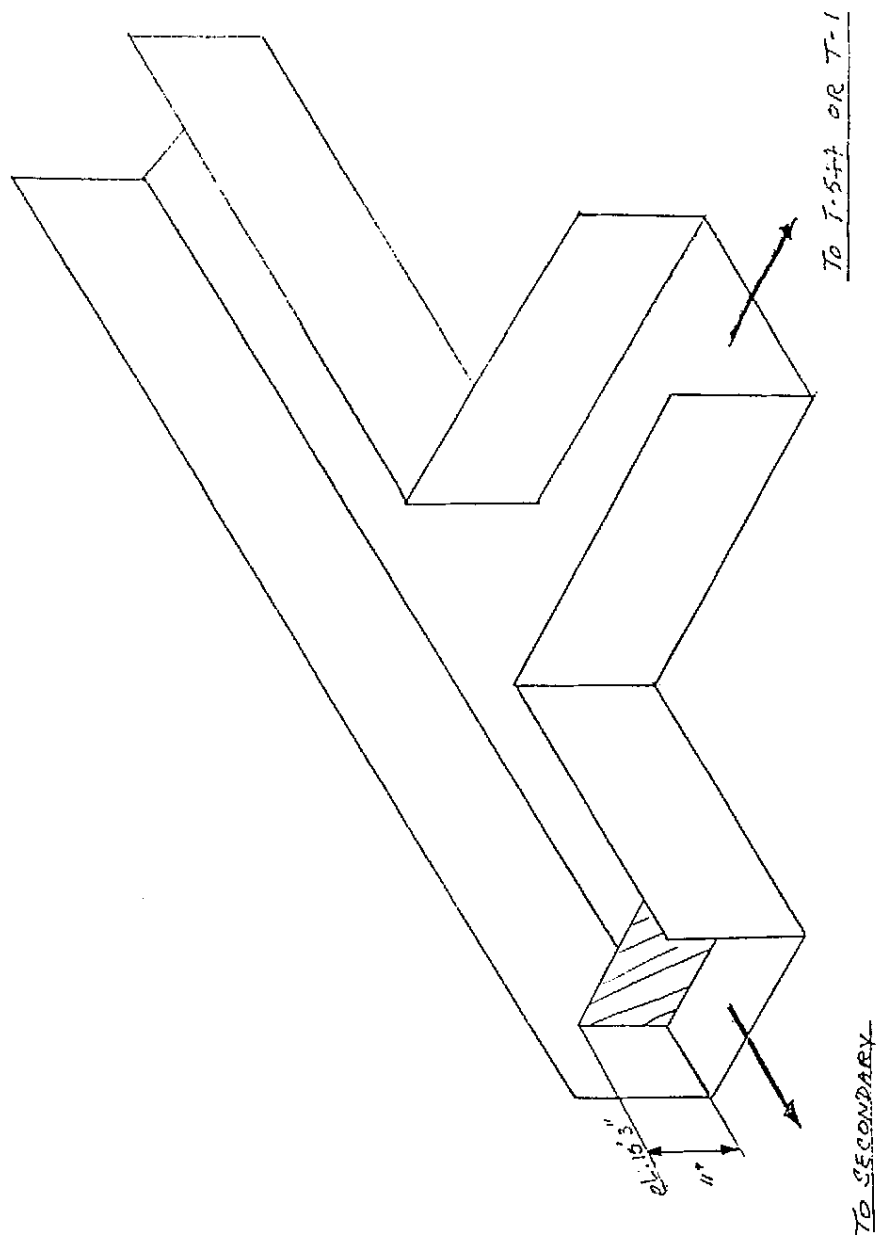
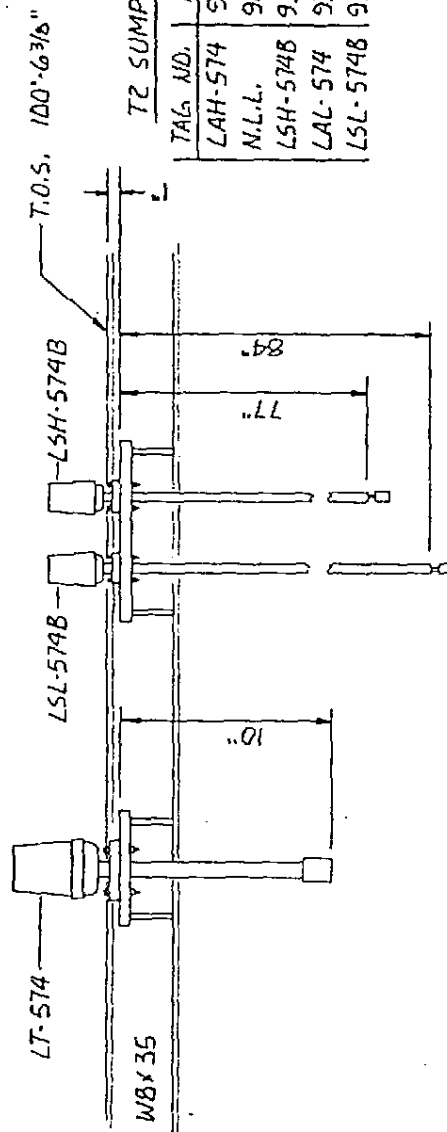
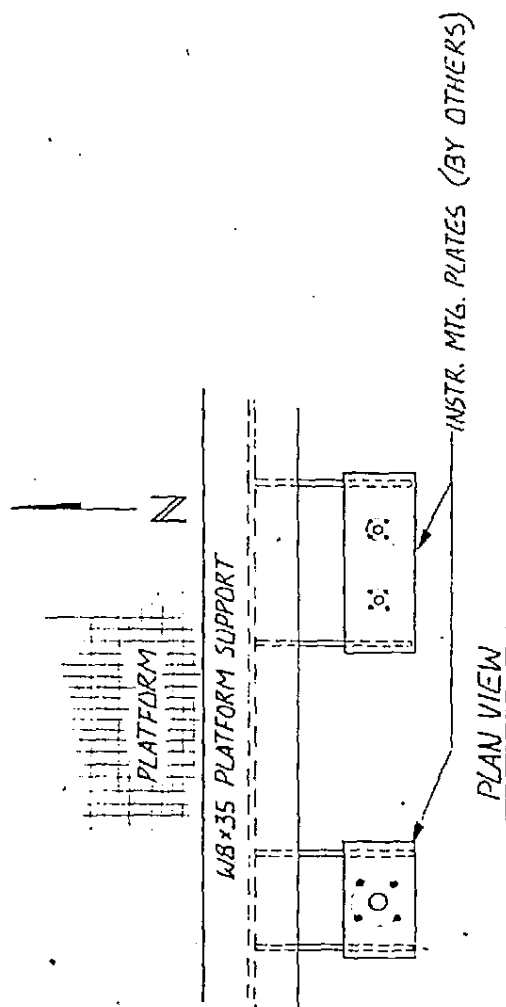


FIG. 7 SECOND DIVERSION WEIR

INSTR. MTG. HARDWARE

TAG #	MOUNTING	BOLTING
LT-574	2" ISO # FLG.	4-5/8" x 3"
LSH-574B	1" ISO # FLG.	4-1/2" x 2 1/4"
LSL-574B	1" ISO # FLG.	4-1/2" x 2 1/4"

ALL MTG. HARDWARE TO BE 316 SS.
INSTALL W/ STD. GASKETS



TAG NO.	ELEVATION	DESCRIPTION
LAH-574	97'-2 1/2"	LT-574 HIGH ALARM
N.L.L.	96'-0"	NORMAL LEVEL
LSH-574B	93'-7"	PUMP ON
LAL-574	93'-6 1/2"	LT-574 LOW ALARM
LSL-574B	93'-0"	PUMP OFF

FIG 8. INSTRUMENT MOUNTING DETAIL
T2 SUMP LEVEL INSTRUMENTS

OPERATING PROCEDURE (Refer to drawing VC-08-8706-PN-7-D)

A. START-UP PROCEDURES (Start with an empty T-544)

1. Set P-544A in automatic position and P-544B in off position.
2. Open the discharge valves on P-544A/B (Figure 9).
3. Open the two valves on the recirculation line.
4. Open the 3" valve upstream of F-544A (Figure 10).
5. Open the two 3/4" valves on the F-544A differential pressure gauge.
6. Open the 3" valve immediately downstream of F-544A.
7. Close the valve on F-544B side, upstream of the strainer.
8. Close the 2" valve on the control valve bypass line.
10. Close the 2" T-512 bypass valve that discharges to the trench.
11. Open the T-544 inlet valve.
12. Remove the temporary partition and let trench water flow into T-544.

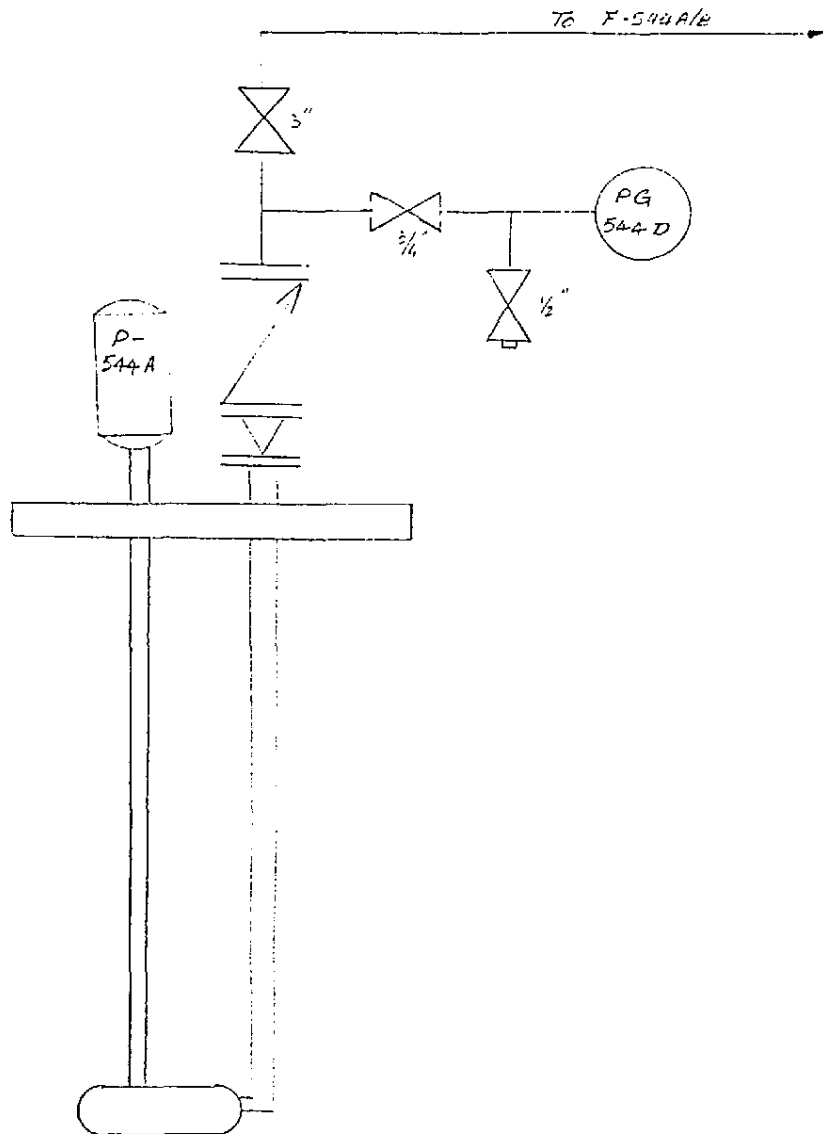


FIG 9 P-544A

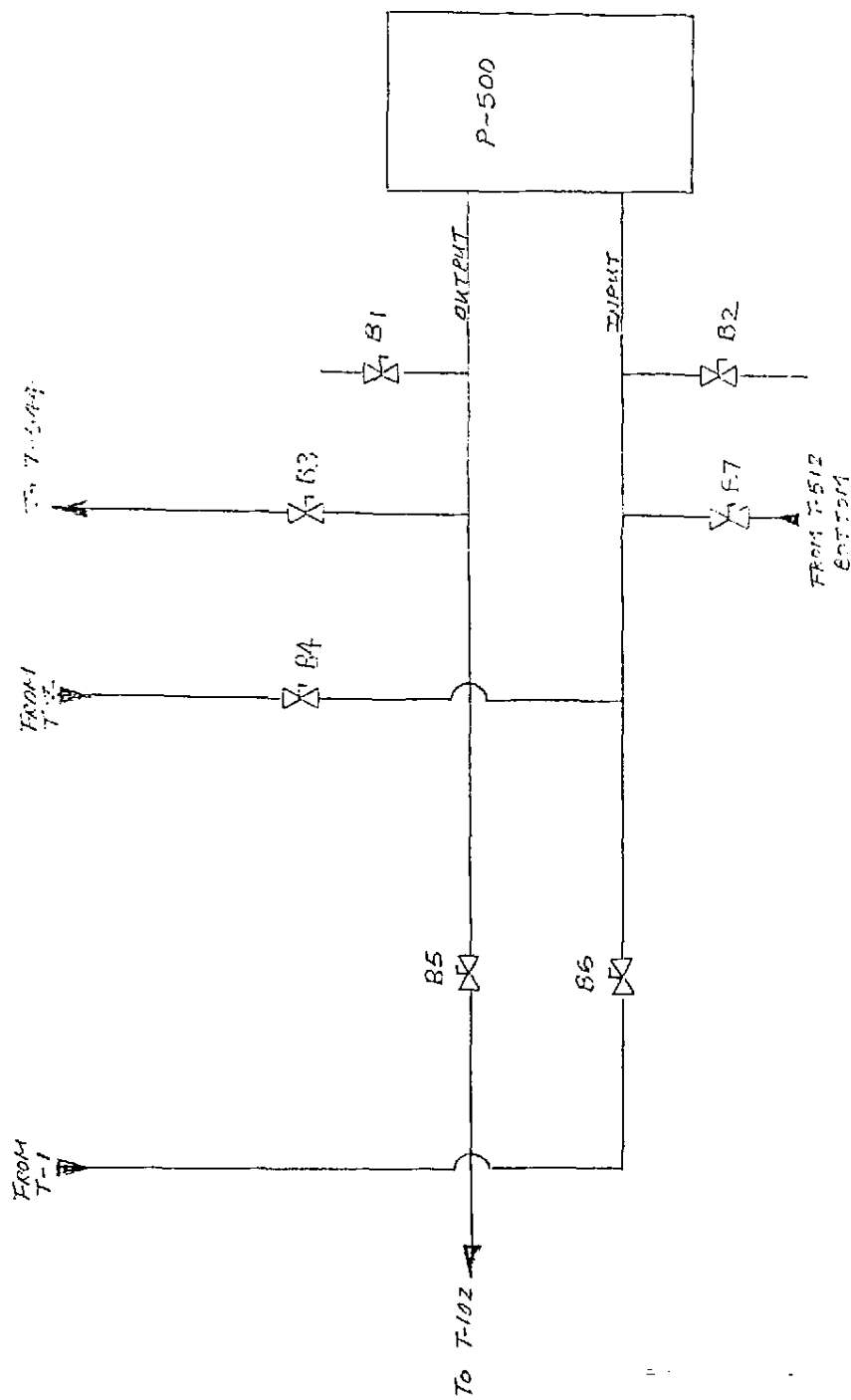


FIG 11. P-500 VALVES LOCATION

13. Observe the low level alarm. It should go off since the level is lower than 25% initially.
14. Observe P-544A, It should be off since the level is below 20%.
15. P-544A should start pumping when the water level rises to 20%, about 15" from the bottom of the shallow side of the tank T-544.
16. When P-544A starts pumping, observe the differential pressure gauge of F-544A. The strainer should be able to handle the flow. If not, the strainer pressure can build up until a rupture disc blows at 100 psig and sends discharge back to T-544. This should not normally occur, it is a safety device to protect the strainer from overpressure.

Note: If the F-544A local differential pressure indicator shows a high pressure drop, that means the second strainer needs to be put in service (if it is the initial start-up). If it is not an initial start-up, the filter inside the strainer is probably plugged and needs to switch to the other strainer.

17. Observe the T-544 level when it reaches 75% and make sure the high level alarm goes off.

Note: If the level is not expected to reach 75% because the pump-out rate is faster than the inlet rate, turn the pump off. This will allow testing of the high level alarm.

18. Wait until the high level alarm goes off and then turn the pump, P-544A, back to automatic position.

B. GENERAL OPERATION PROCEDURES

Normally T-544 is under automatic control. The amount of operating work required is small, unless there is a level problem or a transfer is needed. A routine check of the tank T-544 for leaks is needed at least once per month. Pump P-544A and P-544B should be used alternately every two weeks.

1. FILTER INSPECTION

Inspect both F-544A/B strainers at least once per month. More frequent inspection may be required if there are heavy rainfalls. Inspection frequency is very likely to be changed after the unit has been put in service long enough that the need of filter inspection can be determined by high differential pressure gauge reading.

(Assume F-544A is in service and F-544B is a stand-by.)

1. Isolate F-544A.
2. SLOWLY open the 3/4" valve below the strainer to drain the contents. Slowly open the 3/4" valve above the strainer to equalize the pressure.
3. Remove cover and check strainer for clarity.
4. Inspect the filter for dirt, change a new filter bag if necessary.
5. Put the O-ring back around the strainer and adjust the adjustable screw such that it is at the same level as the edge of the strainer.
6. After the inspection, F-544B will be in service until the next inspection.

2. TRANSFERRING FROM T-1 TO T-544

Before transferring to either T-544 or the secondary, a chemical analysis is required to find out if the liquid should be processed by the steam stripper. If the analysis shows the liquid has to be processed by the steam stripper (i.e., greater than 100 ppm of EDC), then the transfer to T-544 is needed. If the EDC content is less than 100 ppm then liquid can be pumped to the secondary.

To transfer liquid from T-1 to T-544, use P-500 and existing piping.

To transfer liquid from T-1 to secondary, use a flexible hose, the existing piping and P-500.

3. T-2 PIT TRANSFER

The top of T-544 is higher than the top of the trench. Therefore, process runoff water should not overflow into T-2. However, rain water may accumulate in T-2. In order to keep T-2 dry for tank inspection, this accumulated water needs to be transferred. To determine where the water should go, a sample analysis is needed. If the EDC concentration is higher than 100 ppm, the water goes to T-544. Otherwise water will be transferred directly to the secondary.

4. T-544 SOLIDS INSPECTION AND CLEANOUT

T-544 has a removable baffle to aid in solids collection. It is important to inspect the degree of solid accumulation at least once every two weeks. (Frequency is subject to change after the unit is put in service.) A cleanout is needed if the accumulation is high.

Inspection and cleanout procedures:

1. Open the control valve (LCV-574) bypass.
2. Pump as much water to T-512 as possible.
3. When level is low for P-544A then connect a flexible hose from T-544 upstream of the baffle to valve B2 of P-500 (Figure 10).
4. Connect another flexible hose from P-500 to T-1
5. Keep the end of the hose a few inches into the water during the transfer so that the solids at the bottom of the tank will not be disturbed and solids do not damage the pumps.
6. Remove solids. Have Lab analyze sample and consult the Environment Coordinator for proper disposal of the solids.
7. Pump the water from T-1 back to T-544.
8. Turn the pump P-544A in automatic position and P-544B in off position.
9. Close the control valve bypass.

5. CHECK T-544 FOR LEAKS

T-544 is set inside T-2. T-2 acts as containment to T-544 in case of leaks. The leak check is made by looking into T-2. If there is no accumulation, no significant leak is detected.

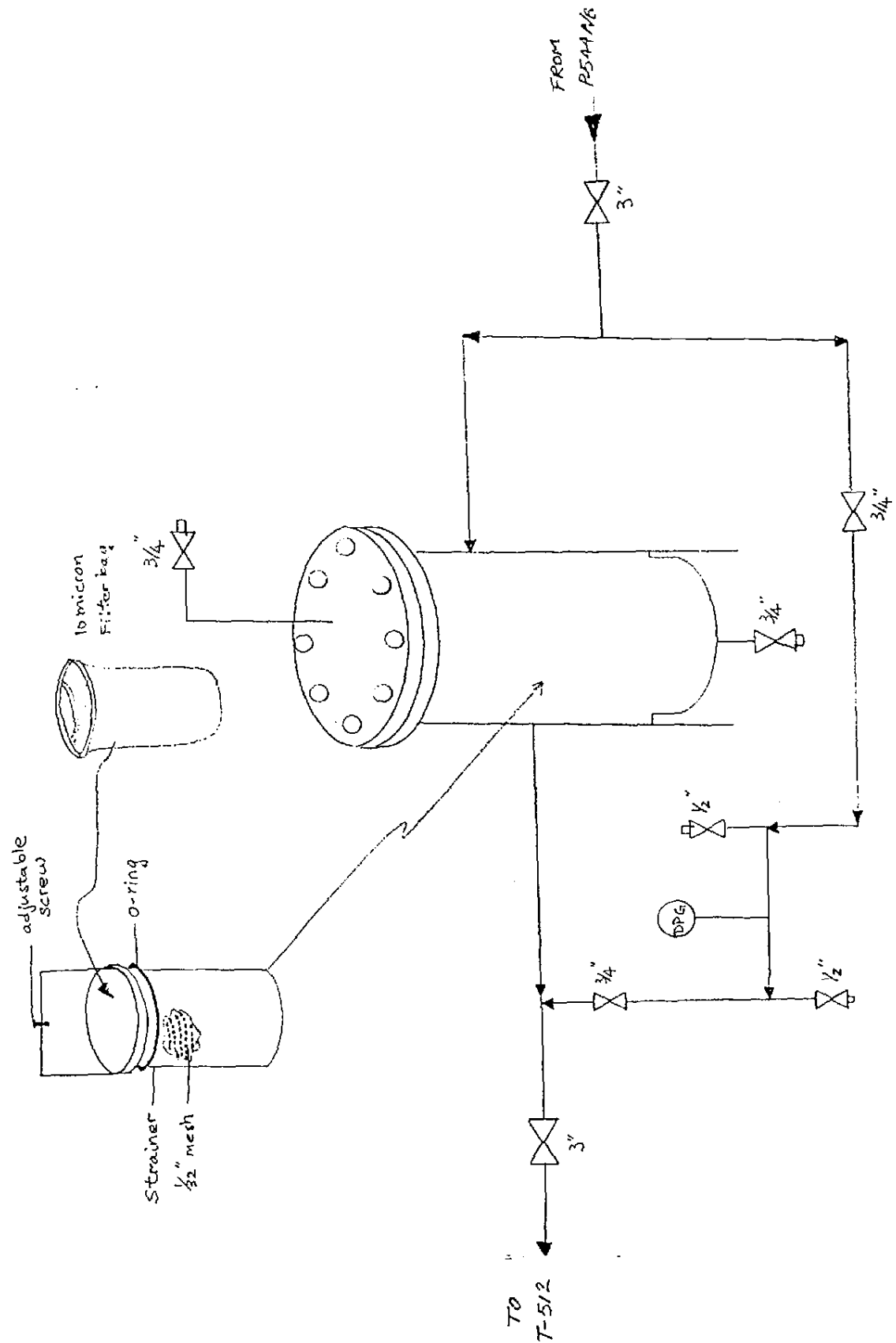


Figure 10. P/I of STRAINER

ALARMS

A. LOW LEVEL ALARM

Responses

1. Check level and see if it is lower than 25%.
2. Check recirculation line. See if there is any recirculation. If not, orifice may be plugged.
3. Check T-544 inlet valve. See if it is closed or plugged.
4. If everything is fine, check back in 5 minutes and see if the pump shuts off automatically if the level drops to 20%.
5. If the pump does not shut off at a level lower than 20% of liquid, control the level manually by turning the pump on and off manually and have instrument department check out the control system.

B. HIGH LEVEL ALARM

Responses

1. Check and see if pump is operating properly. The suction may be blocked by large objects. If this is the case remove the objects that block the pump.
2. Check the differential pressure gauge and see if the pressure is high. High pressure indicates a plug in the strainer. The other strainer needs to be put in service.
3. Check the process unit to determine if unusually high flow of runoff is occurring and correct the situation accordingly (water hoses left on, etc.) if possible.
4. If none of the above can correct the problem, or the level keeps rising because of a rain storm, let the tank fill up. The first diversion weir will divert water to T-1 for treatment.

EQUIPMENT LIST

<u>ITEM #</u>	<u>DESCRIPTION</u>	<u>STATUS</u>
P-544A/B	Process Runoff Pumps	New
P-500	Waste pit portable pump	Existing
T-544	Process Runoff Diversion Tank	New
F-544A/B	Process Runoff Strainers	New
T-512	Sewer Collection Drum	Existing
T-1	90 Day rainfall collection tank	Existing
T-2	Containment tank for T-544	Existing

INSTRUMENT LIST

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>STATUS</u>
LCV-574A	Level Control Valve	New
LIC-574A	Pneumatic Level Controller	New
LSL-574B	Low Level Switch for pump	New
LSH-574B	High Level Switch for pump	New
LSHL-574A	Level switches for high and low level in Transmation	New
LAHL-574	Level alarms for high and low level in control room	New
LT-574	Pneumatic Level Transmitter	New
RD-544A/B	Rupture Disc, 100 psig	New
PG-544A/B/C/D	Pressure Gauge, 0-50 psig	New
RO-544	Restriction Orifice	New
LY-574A	I/P Transducer	New