

TABLE 7

7/19/78

EXPLANATION OF ACID/ALKALI SEWER NUMBERS

CONFIDENTIAL
Subject to Protective Order
of 14th Judicial District Court
No. 92-1145

Present Acid Distribution

All numbers were taken from records department and/or operating personnel.

Acid sources (HCl plant productions) do not include inventory change. The orifice measuring Per/Tri reactor vent flows to the HCl absorber was not accurately accounting for all the weak acid produced in the absorber due to the erroneous assumption that the reactors were operating at a constant pressure. The vent flows have been corrected for varying reactor pressures by a factor of 0.803. This correction produced an HCl TPD that confirmed the total HCl TPD being measured from the bottom of the Per/Tri HCl absorber. The agreement of the two HCl measurements assures greater efficiency in accounting for weak acid produced and consumed.

Miscellaneous acid sewers was an adjustment stream to balance the alkali presently being sewered.

Alkali to Sewer

Silica Pigments' effluent to the sewer was calculated to have 13 TPD HCl equivalent of alkali. This was calculated using the alkali reported from the #4 overflow and scaling up to the total sewer flowrate. This was checked using the material balance for the Pigments plant.

$$\frac{Na_2O}{(lit)} \frac{(2.5 \text{ gr/lit}) (1 \text{ kg})}{(1000 \text{ gr})} \frac{(8.3452 \text{ lb/gal})}{\text{kg/lit}} = 0.02085 \text{ lb/gal}$$

Assume total plant sewer = 1500 gpm at production rate of 100 TPD.

$$(0.02085 \text{ lb/gal}) (1500 \text{ gal/min}) \frac{(1440 \text{ min})}{D} \frac{(1 \text{ ton})}{2000 \text{ lb}} = 22.5 \text{ TPD } Na_2O$$

$$\frac{2 \text{ mole } Na_2O}{\text{mole HCl}} \times 22.5 \text{ TPD } Na_2O \times \frac{(36.47 \text{ TPD HCl})}{(1 \text{ mole/D HCl})} \times \frac{(1 \text{ mole/D } Na_2O)}{(61.98 \text{ TPD } Na_2O)} = 13 \text{ TPD HCl equivalent}$$

26
26 TPD for 150
45 TPD for 260

Caustic for pH control was taken from the Records Department, as was tank 17 & 18 equivalent TPD.

Alkali in the incinerator secondary scrubber effluent was based on a 14.5 gpm flowrate of cell liquor to the secondary scrubber.



$$1350 \text{ lb/hr } NaHCO_3 \frac{(36.47 \text{ lb/hr HCl})}{(84.01 \text{ lb/hr } NaHCO_3)} = 586.06 \text{ lb/hr} = 7.03 \text{ TPD HCl}$$

018 Sewer NaOH - HCl Balance

Based on Conditions Tuesday Afternoon 9/20/83

<u>Acid Sources to 018</u>	<u>Flow (gpm)</u>	<u>HCl (gpl)</u>	<u>HCl (TPD)</u>
#1 WTU SS Effl.	<u>400</u>	<u>3.8</u>	<u>8.64</u>
#2 WTU SS Effl.	<u>700</u>	<u>3.8</u>	<u>15.90</u>
#1 Inc. Prim. Effl.	<u>550</u>	<u>0.62</u>	<u>2.05</u>
#2 Inc. Prim. Effl.	<u>Down</u>		
#3 Inc. Prim. Effl.	<u>Diverted to 010</u>		<u>0</u>
#4 Inc. Prim. Effl.	<u>350</u>	<u>0</u>	<u>0</u>
TOTAL	<u>2000</u> gpm	<u> </u> gpl	<u>26.59</u> TPD HCl

Plant C - Cl₂ + Caustic

FLOW = 1280 gpm, 2.5 gpl

NaOH = ~~19.2~~ TPD NaOH

21 TPD HCl

17.1 TPD HCl

ACID HEADER TOTAL

26.59 TPD HCl - (19.2 TPD NaOH) $\times \frac{1.12 \text{ HCl}}{\text{NaOH}}$ = 9.07 ✓
~~4.24~~ TPD Xs HCl in Acid H.

CAUSTIC HEADER TOTAL

Silica @ 2690 gpm + 2.4 gpl Na₂O = 38.02 TPD Na₂O

44.8 TPD HCl

VDCM R_x Bottoms Total

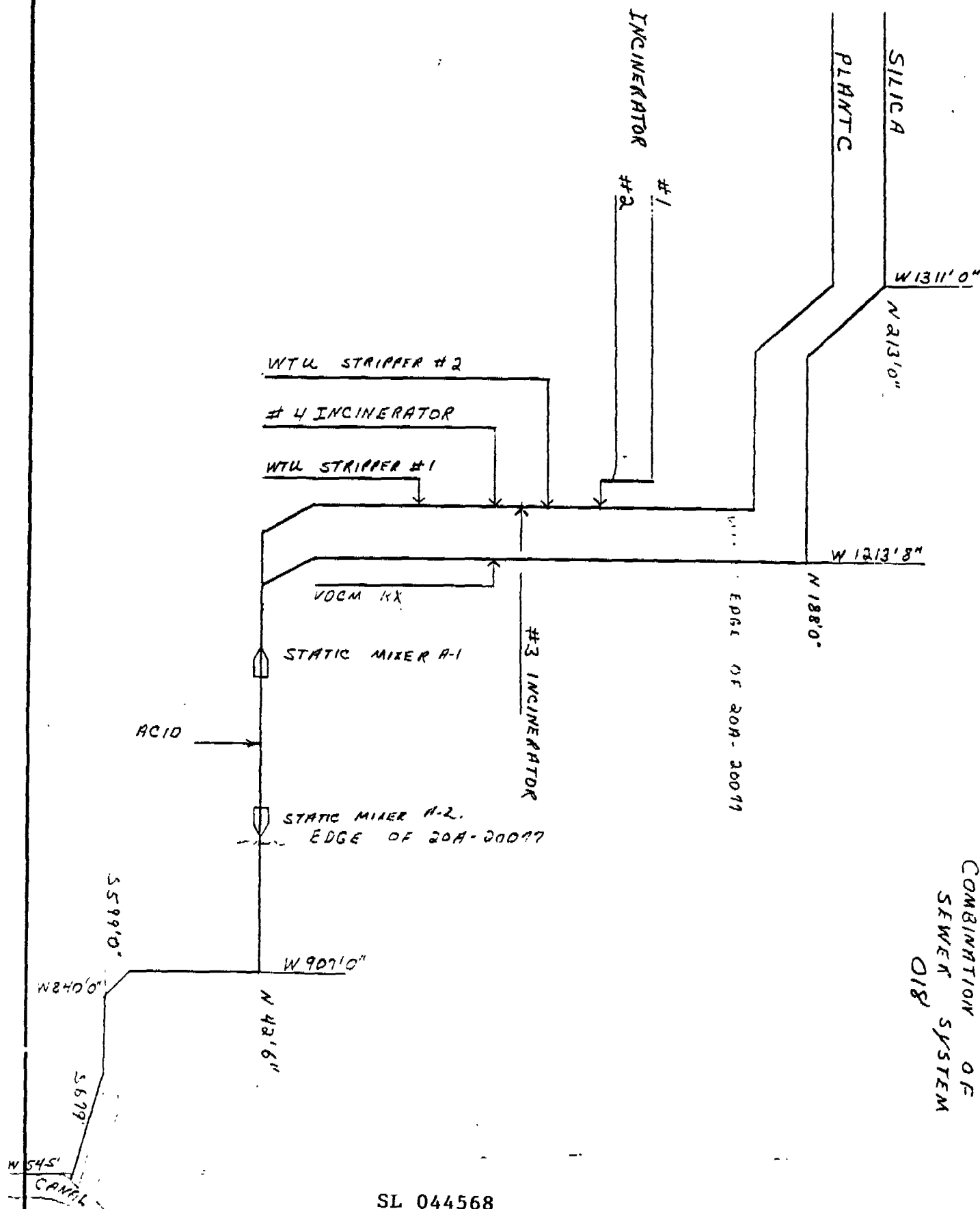
230 gpm @ 20.4 gpl NaOH = 3.67 TPD NaOH

3.28 TPD HCl

018 Total HCl Before COS

9.07
~~4.24~~ TPD HCl - (38.02 TPD Na₂O) $\times \frac{.85 \text{ HCl}}{\text{Na}_2\text{O}}$ - (3.67 TPD NaOH) $\times \frac{1.12 \text{ HCl}}{\text{NaOH}}$
 (Acid Hdr.) (Caustic Hdr.) (VDCM)
44.8 62 1.18
~~39.04~~ ~~4.9~~
-38.9

*Note: This is The Balance Larry Grubb did 9/20/83.
 This will be done daily until you say different.



COMBINATION OF
SEWER SYSTEM
018

SL 044568