

CHEMICALS



INTEROFFICE / LAKE CHARLES

TO W. L. Oglesby

DATE Dec. 13, 1983

FROM M. G. Carver *MC.*

SUBJECT BAT Metals Removal

Attached are the results of experimentation recently completed to determine the feasibility of including 014 with Plant B effluents as a source of sodium hydroxide for metals removal. In summary, the results indicate a reduction in operating costs could be realized. It is also noted that complete removal of TSS in 014 could be achieved if necessary (based on jar tests). Earlier jar tests with Outfall 014 showed 50-70% reduction in TSS. Upon mixing with Plant B effluents, the removal efficiency has been increased to 80-99% removal.

The outfalls were mixed based on the following flow rates:

WTU ¹	-	775 (gpm)
SFD ²	-	110
VDC ³	-	62
014	-	1500

¹ WTU - Waste Treatment Unit effluent

² SFD - Sodium Formate Dest. effluent

³ VDC - VDC reactor bottoms aq. effluent

The chlorine bearing streams were dechlorinated and mixed accordingly. The amount of NaOH required to reach pH 10.5 (optimum for metals removal) was determined before and after the addition of 014.

Also attached are the data from the most recently completed jar test verification study. Please include these data with 12-6-83 memo.

MGC/ce

Attachments

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SL 078054

<u>Sample Date</u>	<u>VDC</u>	<u>WTU</u>	<u>SFD</u>	<u>pH</u>		<u>Plts A & B Mixed</u>	<u>% Reduction in OH⁻ Requirement</u>
				<u>014</u>	<u>Plt B Mixed</u>		
12-05-83	12.7	<1	7.7	12.1	1.0	2.2	60
12-06-83	12.7	1.1	7.6	12.3	1.1	7.6	79
12-07-83	12.4	<1	8.5	12.1	1.0	2.3	65
12-09-83	12.7	1.3	8.4	12.1	1.3	9.2	78
12-09-83	12.7	<1	8.4	12.2	1.3	9.7	73

DATE SAMPLES COLLECTED - 12-1-83

	Initial pH	Free Chlorine (mg/L)	Na ₂ S ₂ O ₃ (mg/L)	Combined pH
VDC	12.5	< 0.01	NA	1.1 } 1.8
WTU	< 1	< 0.01	NA	
SFD	8.1	3238	1801	
014	11.5	1182	657	

TREATMENT OF VDC, WTU AND SFD

Treatment	Settled Sludge %	Metals Conc (ppm)				TSS (ppm)
		Fe	Cu	Ni	Cr	
Control	< 1	214.0	84	4.6	0.5	< 1
NaOH	27	1.32	0.93	0.21	0.03	< 1
NaOH (filtered)	NA	1.32	0.96	0.10	0.02	< 1
Ca(OH) ₂	20	1.14	0.64	0.16	0.03	< 1
Ca(OH) ₂ (filtered)	NA	0.84	0.59	0.13	0.03	< 1

OH-Precipitating Agent	TSS During Flocculation (ppm)	Volume Used to Reach pH 10.5
50% NaOH	2604	5.6 L / 750 mL
10% Ca(OH) ₂	644	40.1 mL / 750 mL

12-1-83-cont'

TREATMENT OF 014, SFD, WTU, AND VDC

Treatment	Settled Sludge %	Metals Conc (ppm)				TSS (ppm)
		Fe	Cu	Ni	Cr	
014 Control	<2	3.9	3.8	2.1	0.10	688
Mixed Control	<1	4.3	4.3	4.3	4.3	4.3
NaOH	18.7	0.81	0.36	0.04	0.02	<1
NaOH (filtered)	NA	0.81	0.37	0.12	0.02	<1
Ca(OH) ₂	8.2	1.34	0.46	0.20	0.02	<1
Ca(OH) ₂ (filtered)	NA	0.84	0.37	0.24	<0.01	<1

OH-Precipitating Agent	TSS During Flocculation (ppm)	Volume Used to Reach pH 10.5
50% NaOH	716	1.3mL/750mL
10% Ca(OH) ₂	1268	12.0mL/750mL

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