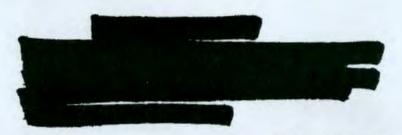
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QUARTERLY REPORT

CONTAMINATION CONTROL - COLUMBIA RIVER

APRIL - JUNE 1968

CLASSIFICATION CANCELLED

CHANGED TO DECLARAGED

BY AUTHORITY OF RLO CC2-4

BY SE Judge DATE 11-27-89

Cleanenge 11-28-89

R. G. Geier Program Manager Process and Programs Section

October 15, 1968

DOUGLAS UNITED NUCLEAR, INC.

RICHLAND, WASHINGTON

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CHEMICALS DISCHARGED TO THE COLUMBIA RIVER FROM DUN FACILITIES FISCAL YEAR 1968

Introduction

This report summarizes the chemical disposal data from facilities operated by Douglas United Nuclear, Inc., during fiscal year 1968.

The total quantity of chemicals discharged to the Columbia River from the Single Pass Reactor facilities is detailed in Section I and from the N Reactor facilities in Section II. In addition to the gross quantities shown, supplementary information has been included to note the manner and normal rate of discharge.

Section III summarizes the disposal frequencies and estimated quantities of chemicals discharged to the 300 Area process ponds from DUN facilities. These materials are discharged to the process sewer and flow to the 300 Area process ponds. A portion, if not all, of the chemicals reach the Columbia River through underground seepage.

As the process sewer system in the 300 Area serves other companies as well, the controls established by DUN include routine composite sampling of the 300 Area process ponds. An automatic sampler which collects integrated samples of pond inlet water was placed in service in August, 1967. This analytical data is included as Section IV.



DUN-4668



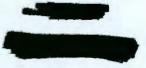
SINGLE PASS REACTOR FACILITIES

		G	uantity	Consumed - Po	unds		
Chemical	100-B	100-C	100-D	100-KE	100-KW	Total	
Water Treatment			:				
Aluminum Sulfate ^{1,2} Bauxite ¹ Sulfuric Acid (as 100%) ² Chlorine ³ Polyacrylamide ⁴ Sodium Dichromate ⁵ Sodium Silicate ^{6,7} Ammonium Sulfate ⁷	160 019 763 420 2 4 958 226 11 134 310 2 250 159 996	59 561 2 131 357 3 406 3 4 391 3 100 226 020	29 054 60 000 136 640 26 430 354 208 226	3 458 664 3	3 222 162 .9 (. 776 220 60 ; 786 857 2 (. 12 125 725 354 1		
Reactor Decontamination					1		
Turco 4306 - C,D8 Wyandotte8	30 000 40 375	75 500			41 725		

Explanatory Notes

- Total of these two quantities represents an average aluminum sulfate feed rate of 14.8 ppm. The aluminum contribution from these two sources would be about 1.35 ppm with essentially all retained at the filters and discharged to the river through process sewers during filter backwashing.
- 2. Sulfate (SO₁) contribution from these two chemicals represents about 26.2 ppm continual discharge to the river in the reactor effluent system.
- 3. Represents a continual feed of about 0.89 ppm of which essentially all discharge to the river in the form of chlorides in the reactor effluent system.
- 4. Represents an average feed of 0.015 ppm. This material is retained at the filters and discharged to the river through process sewers during filter backwashing.
- 5. Represents an average feed of 0.83 ppm continually discharged to the river in the reactor effluent system.
- 6. Sodium silicate at 100D was excess material that was diluted and drained to the river through the process sewer in May, 1968.
- 7. Sodium silicate at 100KW and ammonium sulfate were used to prepare activated silica for testing under PTA-082 during the period Oct. through March, 1968. Material was used in lieu of normal polyacrylamide material and retained at the filters and discharged to the river during filter backwashing.
- 8. Material used for rear face decontamination at 105 B on September 10 and 11, 1967; at 105C on January 21, 1968, and at 105KW on June 8 and 9, 1968. No direct discharge to river for in all cases, material was discharged to basins or cribs for ground disposal.

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SECTION II

N Reactor Facilities

Chemical	Quantity C	onsumed
Water Treatment - Filtered		
Aluminum Sulfate	378 43	
Polyacrylamide		0 lbs.
Chlorine	28 23	6 lbs.
Water Treatment - Demineralized ²		
Sulfuric Acid (as 100%)	1 308 79	5 1bs.
Sodium Hydroxide (76% Na20 basis)	424 31	13 lbs.
Other System Additives ³		
Ammonium Hydroxide (25% NH3 by weight)	37 19	7 gals.
Sodium Dichromate	15 70	00 lbs.
Hydrazine, N2H4 (25% solution)	9 90	00 lbs.
Morpholine, NH (CH2)20(CH2)2	3 67	70 lbs.

Explanatory Notes

- 1. Total filtered water requirements averaged 6500 gpm. Aluminum sulfate coagulant feed rate averaged 13.2 ppm with the aluminum content being a calculated 1.2 ppm and sulfate a calculated 6.2 ppm. Essentially all of the aluminum is retained at the filters and discharged to the river through the waste discharge line during filter backwashing. Polyacrylamide, filter conditioner material, represents an average feed rate of 0.033 ppm with the material retained at the filters and discharged to the river through the waste discharge line during filter backwashing. Chlorine represents a continual feed of about 1.0 ppm discharged eventually to the river in the form of chlorides.
- 2. Sulfuric acid regenerations totaled 793 with the average pounds of acid used per regeneration being 1650. The sulfate discharged to the river through the outfall line at each regeneration averaged a calculated 1620 pounds. Caustic regenerations totaled 295 with the average pounds of caustic used per regeneration being 1438. The sodium discharged to the river through the outfall line at each regeneration averaged a calculated 800 pounds.
- 3. Ammonium hydroxide is used for ph correction of primary system make-up water and sodium dichromate is added to the rod cooling water system. Both these systems discharge to the crib. Hydrazine and morpholine are both primarily additives to the secondary system. This system discharges to the river through the outfall line.

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	SECTION III		Chemicals Dischar	rged to 300 Area	Process Sewer, Fisc	al Year 1968	
	Chemical	Bldg.	Location	Approx. Quantity (LB)	Approx. Disch. Frequency	Est. 1968 Total (lbs)	Basis for Estimate
	Aluminum Sulfate		Process Ponds ¹		Continuous	65 000	Store order
	Sodium Hydroxide	313 313 313 313 306	Sleeve Machine Stripper Tank Spire Etch Tool Cleaning Pilot Plant	2 000 500 110 500	Weekly 12/mo Weekly Weekly TOTAL	105 000 70 000 6 000 25 000 1 000	as shown as shown as shown Store order
2	Nitric Acid	313 313 306	Final Etch Mach Spire Etch Tank Pilot Plant N Fuels ²	4 500 60	6/year weekly	27 000 3 000 18 000 475 000	as shown as shown Store order Total Purchase 520 000. Less 45 000 to 313
<u>.</u>					TOTAL	523 000	Recovery
<u> </u>	Aluminum Nitrate		N Fuels ²			13:000	Store order
ו ו	Ammonium Bifluoride		N Fuels ²			22 000	Store order
	Deoxidizer Oakite 34M (Discontinued us	313 e in Jan.	Cap & Can Mach. 1968)	1425	Weekly	20 000	Store order
	Deoxidizer: Oakite LNC (Began use in Ja	313 n. 1968)	Cap & Can Mach.	550	3 months	1 100	as shown

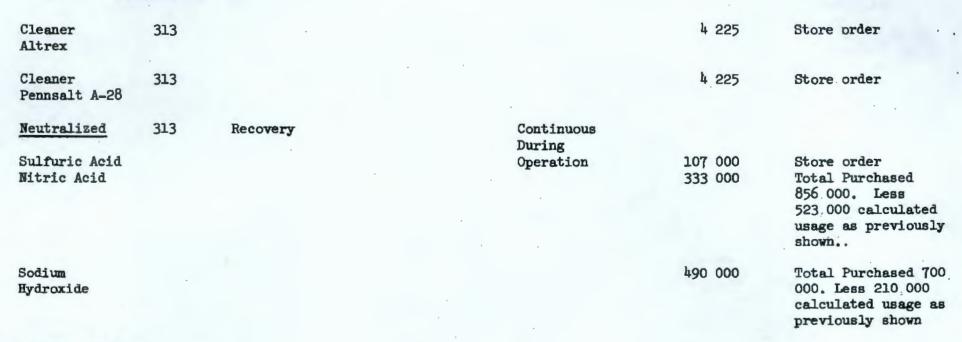
Turco Aluminetch

Aluminux 313

313

3 875 Store order

7 225 Store order



Explanatory Notes:

1. Continuous feed to the process sewer on a test basis to improve particulate matter settling in the process ponds.

normally be as	For	Quantity	Approx. Discharge Frequency	Estimated Yearly Total
Nitric Acid	Uranium Cleaning " Cu & Zr-2 Cleaning Cu Strip & Chem Mill " Prebraze etch " Preweld etch Final etch 306 N Fuels	500 lbs. 300 lbs. 800 lbs. 1 500 lbs. 1 700 lbs. 1 400 lbs. 700 lbs. 1 200 lbs. 600 lbs.	2 weeks 2 weeks Weekly Daily 4 weeks weekly 3 weeks weekly weekly	Estimated Yearly Total 13 000 8 000 40 000 375 000 (20 000) to 313 Recovery 70 000 12 000 60 000 30 000 (25 000) to 313 Recovery 608 000

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Aluminum Nitrate	Cu & Zr-2 Cleaning Preweld Etch Final Etch	200 lbs. 200 lbs. 200 lbs. 200 lbs.	2 weeks 2 weeks weekly weekly	1	5 000 5 000 0 000 0 000 30 000
Ammonium Bifloride	Cu & Zr-2 Cleaning Prebraze etch Preweld etch Final etch 306 N Fuels	75 lbs. 75 lbs. 75 lbs. 75 lbs.	weekly weekly weekly weekly		4 000 4 000 4 000 4 000 1 000
Sulfuric Acid	Cu Strip & Chem Mill 306 N Fuels	4 200 lbs.	4 weeks	((55.000) (17.000) (72.000) to 313 Recovery





SECTION IV

Chemical Analyses of Inlet Stream to 300 Area Process Ponds*

		C1 ppm	Cu ppm	Fe ppm	F ppm	NO ₃	SO ₄	Cr+6	U ppm	рН
	9-5 to 12-11-1967									
	Average	1.38	.02	.02	0.89	108	25	.16	.13	7.9
	Maximum	2.65	.05	.04	3.35	189	45	.64	.30	9.9
	Minimum	.8	.00	.01	0.00	39	18	.05	.03	7.1
	1st Quarter 1968			1					~	
	Average	2.16	.016	.028	3.1	149	33	.081	.134	8.35
H	Maximum	3.6	.040	.048	4.10	117	56	.20	.25	9.4
5	Minimim	1.0	.002	.006	1.52	77	19	.012	.07	7.2
DECLASSIFIED	2nd Quarter 1968							1911		
H	Average	1.73	.026	.019	2.8	132	30	.031	.20	8.3
0	Maximum	3.30	.058	.040	4.47	210	49	.073	.45	10.7
	Minimum	0.6	.009	.004	0.00	82	9	.008	.01	7.1

^{*}Weekly integrated samples



