

E. D. Apolonia Consulting Engineers, Inc.

TABLES

TABLE I
WATER QUALITY AND POLLUTION LOAD
LANGELOTH-FRANCIS MINE COMPLEX

Test Date	Sampling Point	Description	Estimated Flow gpm	pH	Acidity*		Iron		Sulfate	
					mg/l	lb/day	mg/l	lb/day	mg/l	lb/day
Feb. 3, 1972	2A	From Piezometer #2A	---	9.1	(190)	---	---	---	---	---
	3A	Strip Mine Pond Surface	---	6.2	308	---	140	---	1180	---
	4A	Burgetts Fork at Burgetts-town	---	6.5	(124)	---	58	---	440	---
	5A	Langeloth Main Shaft	---	7.2	(259)	---	3.1	---	580	---
	6A	Langeloth Main Shaft	---	7.1	(252)	---	0.7	---	570	---
	7A	Flowing Borehole	200	5.7	1000	2400	508	1220	4380	10,500
	8A	Burgetts Fork Above Slovan	---	7.6	(179)	---	0.9	---	90	---
	9A	Upwelling in Front of Collapsed Mine Entry	---	3.7	470	---	49	---	2120	---
	10A	Plum Run Below Patterson Mine	---	4.5	400	---	51	---	1270	---
	11A	Plum Run Above Strip Mine Discharge	---	7.2	(190)	---	1.2	---	124	---
	12A	Plum Run Above Strip Mine Entry	---	7.6	(217)	---	1.8	---	88	---
	13A	Unnamed Tributary to Burgetts Fork	---	3.4	340	---	83	---	1850	---
	14A	Unnamed Tributary above Confluence	---	3.3	410	---	93	---	2140	---
	15A	Unnamed Tributary above Confluence	---	6.4	19	---	4.2	---	640	---
	16A	Upwelling in Front of Collapsed Mine	---	6.1	230	---	50	---	1300	---
	July 14, 1971		Langeloth Flowing Borehole	300	5.1	540	1940	1.55	5.6	3200
March 5, 1970	1B	Burgetts Fork Above Slovan	---	6.8	(80)	---	3.1	---	145	---
	2B	Unnamed Tributary Above Slovan	---	7.2	(70)	---	1.4	---	105	---
	3B	Flowing Borehole	250	5.2	500	1500	400	1200	5200	15,600
	4B	Tributary Below Borehole	500	6.2	(20)	(120)	60	360	690	4,150
	5B	Discharge From Strip Mine Pond	200	4.8	(340)	(815)	110	264	1800	4,320
	6B	Tributary Around Strip Pit	---	7.6	(94)	---	1.4	---	124	---
	7B	Strip Mine Pond	---	5.0	(320)	---	135	---	1800	---
	8B	Burgetts Fork at Burgetts-town	---	7.0	(82)	---	12	---	300	---
	9B	Langeloth Main Shaft	---	7.1	(74)	---	1.6	---	1300	---

* Quantities in parentheses are alkalinity.

TABLE II

WATER QUALITY DATA
(SAMPLING BY DER)
LANGELOTH-FRANCIS MINE COMPLEX

PARAMETER	LOCATION 5					LOCATION 13					LOCATION 22				
	9-30-75	10-29-74	11-27-74	12-30-74	1-30-75	9-30-74	10-29-74	11-27-74	12-30-74	1-30-75	9-30-74	10-29-74	11-27-74	12-30-74	1-30-75
PH	6.6	6.6	7.5	7.4	7.0	4.8	4.6	4.2	4.6	4.7	2.9	2.8	3.0	2.8	2.8
ACIDITY, ppm	16	0	0	0	0	212	284	144	242	192	1000	3000	2500	2500	800
ALKALINITY, ppm	290	330	270	216	252	6	10	0	6	8	0	0	0	0	0
TOTAL IRON, ppm	0	0	0	0	0	136.0	135.0	123.0	---	31.5	177.0	430.0	441.0	115.0	33.0
FERROUS IRON, ppm	0	0	0	0	0	112.0	112.0	78.4	1.12	31.36	135.2	336.0	212.8	49.28	0
SULFATE, ppm	925	825	850	850	750	1550	1750	1550	1175	1100	1900	4000	4750	3000	1550
FLOW, gpm	100	100	150	100	100	300	450	300	300	500	400	400	500	300	500
ALUMINUM, ppm	0	0	0	0	0	0	0	0	5.4	0	19.5	128.5	11.8	0	4.9
MAGNESIUM, ppm	12.2	0.1	77.5	0.1	54.5	12.8	8.0	76.0	142.5	54.0	53.5	17.0	120.0	57.0	197.5

E. D. Appolonia Consulting Engineers, Inc.

TABLE III

PRELIMINARY CONSTRUCTION COST ESTIMATE
LANGELOTH-FRANCIS MINE COMPLEX

PHASE I

Mobilization	\$ 25,000
Main Langeloth Shaft (Location 1) ✓	35,000
Langeloth Air Shaft (Location 2) ✓	25,000
Langeloth Slope Entry (Location 6) ✓	35,000
Strip Cut Headings (Location 11) ✓	85,000
Langeloth Boreholes:	
Flowing Borehole (with valve installation) (Location 7) ✓	20,000
Nonflowing Boreholes (Locations 3, 9), 2 @ \$15,000 ✓	30,000
Patterson Mine Drift Entries (Locations 22,23), 3 @ \$25,000 ✓	<u>75,000</u>
	Total
	\$330,000 ✓
	20% Contingency
	<u>66,000</u> ✓
	PHASE I TOTAL
	\$396,000

PHASE II

Mobilization	\$ 25,000 ✓
Main Francis Mine Entries (Locations 31,32,33), 3 @ \$35,000	105,000* ✓
Francis Mine Drift Entries (Locations 40, 41), 4 @ \$25,000	100,000 ✓
Patterson Mine Drift Entries (locations 27, 28), 6 @ \$25,000	150,000* ✓
Plum Run Sinkholes (Locations 47, 48), 2 @ \$7,500	15,000 ✓

* The costs of these items will be very dependent on the conditions left by the Bologna stripping operation.

E. D. Appolonia Consulting Engineers, Inc.

TABLE III

PRELIMINARY CONSTRUCTION COST ESTIMATE
LANGELOTH-FRANCIS MINE COMPLEX
(Continued)

Francis Mine Sinkhole (Location 37)	\$ 10,000*
Northern Francis Mine Headings (Location 36)	40,000*
Langeloth Borehole (Location 8)	<u>15,000</u>
Total	\$460,000
30% Contingency	<u>140,000</u>
PHASE II TOTAL	\$600,000

PHASE III

Mobilization	\$ 12,000
Francis Mine Entry, Dinsmore (Location 39)	25,000
Railroad Cut (Location 38)	100,000
Grouting (Location 38)	<u>150,000</u>
Total	\$287,000
40% Contingency	<u>115,000</u>
PHASE III TOTAL	\$402,000

ADDITIONAL SUBSURFACE EXPLORATION

Piezometers, 600 L.F. @ \$20/L.F.	\$12,000
Borings, 2000 L.F. @ \$15/L.F.	<u>30,000</u>
	\$42,000