AMD Treatment Site
Operation and Maintenance Report

Site: Gavazzi, LT 20
Watershed: Little Toby Creek

Date: 4/29/03
By: G.Swope / K.Hendrickson

	Good	Adequate	Needs Action
Condition of Treatment System Components:			
Vegetation:	X		
Treatment Cells:		X	
Wetland:			X
Rock Lined Waterways:	X		
Water Control Structures:			X
Access Road:	X		
Diversion	X		
Mine Collection System		X	

Activities: There has been a continuing problem with the inlet pipe to the WCS on the wetland plugging almost completely shut and raising the elevation of the water in the wetland until it overflows the dike. The increase in iron from 20 to 50 ppm after the collection system was put in the mine opening has caused considerable iron to precipitate in the wetland. There did not appear to be many cattails in the wetland but it is still early in the growing season. About 1/5 - ¼ of the surface of the first treatment bed has sandy, grainy, dark red iron precipitate between the rocks. This material is dense enough that when the cell is flushed, a small amount of water lays on the surface of the bed. Dug out the inlet end of the 6"wetland outlet pipe and cleaned the WCS.

Upper cell was flushed for about 3 hours until empty. Color of water was same as other flushes, a light creamy red. Water color did not change by end of flush.

There is a wet area about 25 feet down slope of the mine collection system. It is not wet enough to result in runoff and there is no iron staining. There was a small spring of good water about 25 feet to north of mine opening, it may be bleeding through the refuse. There was never any evidence that it did that before. There is no sign of an upwelling directly over the collection point. It is not anything that needs addressed at this time. The flow in the gully that carried the original mine flow seemed to be a little more than what it was last year. It is about 4-5 gpm at the top and increases as it comes down past the site to maybe 10+ gpm.

Action Needed: Need to install 90 degree elbow and short (1') standpipe on inlet end of settling basin outlet pipe or a floating dewatering device. Need to look at long term solution to the iron accumulation in the wetland outlet structure. Will flush again within 1-2 weeks to see if color of flush water will clear up.

Gavazzi AMD Site
Site Visit / Operation and Maintenance Record

NA - Non applicable						SV - Site Visit				Date Site Completed - 9/1/00		
OK - Satisfactory Condition						FS - Flush Treatment System				Inocculated - 9/21/00		
NW - Needs Work						SC - See Comments						
Date	Activity	Who	Flow	Rock Waterways	Vegetation	Embankments	Valves	Weir	Impoundments	Water Control Structures	Access Road	Comments
12/6/2000	FS	GS		OK	OK	OK	OK	OK	OK	OK	OK	ppt. building at outlet of w/w into TB # 2
												Flush water almost black
12/22/2000	FS	GS / KH		OK	OK	OK	OK	OK	OK	OK	OK	DO readings in and out of TB # 1
5/1/2001	FS	GS / KH		OK	OK	OK	OK	OK	OK	OK	OK	DO readings in and out of TB # 1
5/18/2001	FS	GS / KH	40	OK	OK	OK	OK	OK	OK	OK	OK	Stone at wetland outlet starting to plug
6/9/2001	FS	GS / KH		OK	OK	OK	OK	OK	OK	OK	OK	On site with Vail, DO readings on TB#1
												He felt everything was working well.
												Flush water creamy red, cleared in 15"
8/13/2001	SV	GS	9	OK	OK	OK	OK	OK	OK	NW	OK	WCS on WL plugged
9/12/2001	SV	GS	5	OK	OK	OK	OK	OK	OK	NW	OK	Cleaned 6"WL outlet pipe-restored flow
11/27/2001	SV	GS	5	OK	OK	OK	OK	OK	OK	OK	OK	
9/20/2002	FS	GS / KH	4	OK	OK	OK	OK	0K	0K	SC	OK	WCS and outlet plugged and water going
												over dike.Cleaned WCS and outlet pipe.
												PPT. is covering approx. 25% of stone in
												TB #1. Flushed TB# 1-1.5 hours. Color -
												creamy red. No change in color at 1.5 hr
												Need to develop solutuion to WL
												WCS plugging.

COMPUTATION SHEET
SCS–ENG–522 REV. 3–69

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
GPO: 1988—O-337-998

STATE PA		PROJECT LTC		
BY OJ	DATE 6-19-96	CHECKED BY	DATE	JOB NO.
SUBJECT LT-20 Gavotte				SHEET 1 OF

Summary Sheet

Total Cost $104,455

MAX Flow Q = 70 gal/min

Flow	30 gpm
Acid	175 mg/l
Fe	21 mg/l
Al	6 mg/l
DO	1.2 mg/l
PH	3.1

Mg 10ppm <
Fe 0.5ppm <
PH > 5.5
AL < 2ppm
} use 500 ft²/gal/min

2.5 Days Retention time

Hypothetical Access

Disturbed Area	2.0a	
SAPS	.28a	Ponds & WL .40a
Basin	.08a	
Wetland	.04a	
Seeding	1.60a	

System – SAPS – Settling Basin – wetland

COMPUTATION SHEET
SCS–ENG–522 REV. 3–69

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
GPO: 1980—O-337-988

STATE PA		PROJECT LTC		
BY GA	DATE 6-19-96	CHECKED BY	DATE	JOB NO.
SUBJECT LT-20 GAVAZZI				SHEET 2 OF

[redacted] - 30gpm X 125 mg/l X 3.785 = 28613 g/d

28613 g/d ÷ 454 g/# = [redacted] #/d

Size by Area -

28613 g/d [redacted] g/m²/d = 954 m² X 10.76 ft²/m² = 10263 ft²

10265 ft² X 2 ft / 27 X 1.5 tons/yd³ = 1140 Tons

X 3 ft. = 1711 Tons

Size for Detention m = Q Ts Yd/W

m = 30gpm X 1.5 #/yd³ X [redacted] X 60 m/hr X 4.951 X 10⁻³ yd³/gm (= 321 tons

[redacted] Dissolution m = Q CT/X

m = 30gpm X 300 mg/[redacted] X 3.785 l/gal X 525600 m/yr X 10/1000 mg X 2.205 X 10⁻³ #/g X 1 ton/2000 #

m = 548 tons

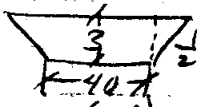
Total tons L.S - 321 + 548 = 869 Tons

Ft³ required for L.S.

869 tons X 14 yd³/1.5 tons X 27 ft³/yd³ = 15642 ft³

Use 40' Bottom width for Slopes @ 3.0 deg %

15642 ft³ ÷ 138 ft³/ft. = 113 ft. (Length)

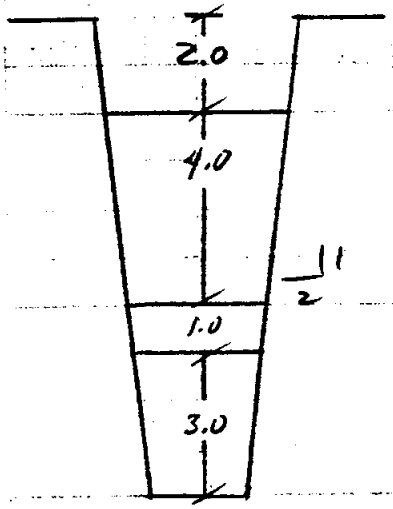


A = 3 X 40 + 2 (3 X 6 / 2) = 138 ft³/ft

COMPUTATION SHEET
SCS-ENG-522 REV. 3-69

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
GPO: 1984—O-337-998

STATE PA		PROJECT LTC		
BY GA	DATE 6-19-96	CHECKED BY	DATE	JOB NO.
SUBJECT LT-20				SHEET 3 OF



	Length	Width
Top	153	80
water	145	72
top Compost	129	56
top L.S.	125	52
Bottom	113	40

Settling Basin – 24 hr Detention

Size – 30 gpm × 1 ft³/7.48 gal × 60 min/hr × 24 hr/d = 5775 ft³

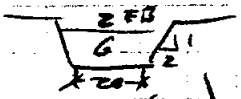
Add Fe Accumulation

30 gpm × 21 mg/l × 5.45 = 3434 g/d ÷ 28316.8 cc/ft³ = .12 ft³/d

.12 ft³/d × 365 d/yr × 25 yr = 1095 ft³

Total Storage – 5775 + 1095 = 6870 ft³

– Use 6' average depth & 20 ft Bottom width



Length = 6870 ÷ 192 = 36 ft

A = 6 × 20 + 2 (6 × 12 / 2)

A = 192 ft³/ft

Top width = 20 + 2(16) = 52 ft

Top length = 36 + 2(16) = 68 ft

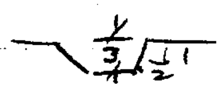
STATE PA	PROJECT LTC		
BY GS	DATE 6-19-96	CHECKED BY	DATE	JOB NO.
SUBJECT LT-20			SHEET 4 OF

Aerobic Wetland – Assume 80% Fe removal in basin

Fe loading = 3439 g/d × .20 = 687 g/d ÷ 10 g/m²/d =

68 m² × 10.76 ft²/m² = 739 ft²

Bottom dimensions – use 25' × 40'



Top width – 25 + 2(6) = 37 ft.
Top Length – 40 + 2(6) = 52 ft.

Water Conveyance

Discharge to SAPS	6" SDR
SAPS to Basin	6" SDR
Basin to wetland	Rock w/w
wetland to drainageway	Rock w/w

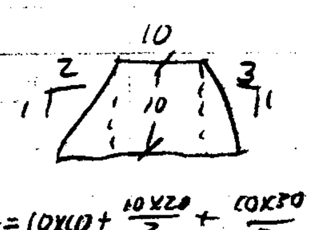
Quantities

Compost 129 × 56 × 1.0 / 27 × ton/2 yd³ = 134 tons × $40/ton = $5360

Limestone 869 tons × $20/ton = $17380

Earthwork

SAPS 153 × 80



Volume = 153 × 350 + 80 × (350 × 0 / 2) + 80 (350 × 0 / 2)
= 81550 ft³ / 27 = 3020 yd³

A = 10 × 10 + (10 × 20)/2 + (10 × 30)/2
A = 350 ft³/ft

Analytical Services, Inc.

R.D. #2, Box 202
Brockway, PA 15824

Laboratory (814) 265-8749
FAX (814) 265-8749

LT 20
GAVAZZI — Powerline

LAB I.D. NO. 0037

CHAIN OF CUSTODY / CHEMICAL ANALYSIS WORKSHEET

SAMPLE DATE 7/13/95 SAMPLING TIME

SAMPLE COLLECTED BY Gary Sawyer
SAMPLE RECEIVED 7-13-95 TIME 4:00 P.M. BY
SAMPLE RECEIVED TIME BY

SAMPLE MATRIX Mine Water
PRESERVATIVE(s) ADDED
SAMPLE LOCATION/IDENTIFICATION LT-20

REPORTED TO WHOM G. Sawyer Needed By

CUSTOMER P.O.#

PARAMETER	RESULT	METHOD	BY/DATE/TIME	COMMENTS/NOTE
PH	3.14	150.1	RD 7/13/95	
Acid	175 mg/L	305.1	RD 7/13/95	
ALK	< 1 mg/L	310.1	RD 7/13/95	
Diss Fe	20.5 mg/L	236.1	WL 7-13-95	
Tot Fe	20.8 mg/L	236.1	WL 7-13-95	
MN	4.6 mg/L	243.1	WL 7-13-95	
Al	5.6 mg/L	202.1	WL 7-13-95	
SO4	530 mg/L	375.4	RD 7/13/95	530x10
DO		4500-O G		ONSITE
NET ACIDITY	175 mg/L	305.1	RD 7/13/95	

SPECIAL REMARKS: