The Success of Remining in Pennsylvania

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The Tool Box

The Remining Program Staff in Pennsylvania's five district offices dealing with surface mines, successfully worked with the Coal Industry to cooperatively permit remining sites increasing reclamation of abandoned mine land.

Six reclamation programs have developed to facilitate remining and reclamation

Having a toolbox with various programs (tools) to choose from, the appropriate ones can be combined to match various idiosyncrasies in designing successful projects.

The Remining Programs developed are:

1. **Government Financed Construction Contracts** coal removal
2. **Miscellaneous Reclamation Projects** coal removal
3. **No Cost Contracts** refuse and coal removal
4. **Reclamation-in-Lieu of Civil Penalty Agreements**
5. **Remining Permits** coal and/or refuse removal
6. **Surety Reclamation.**

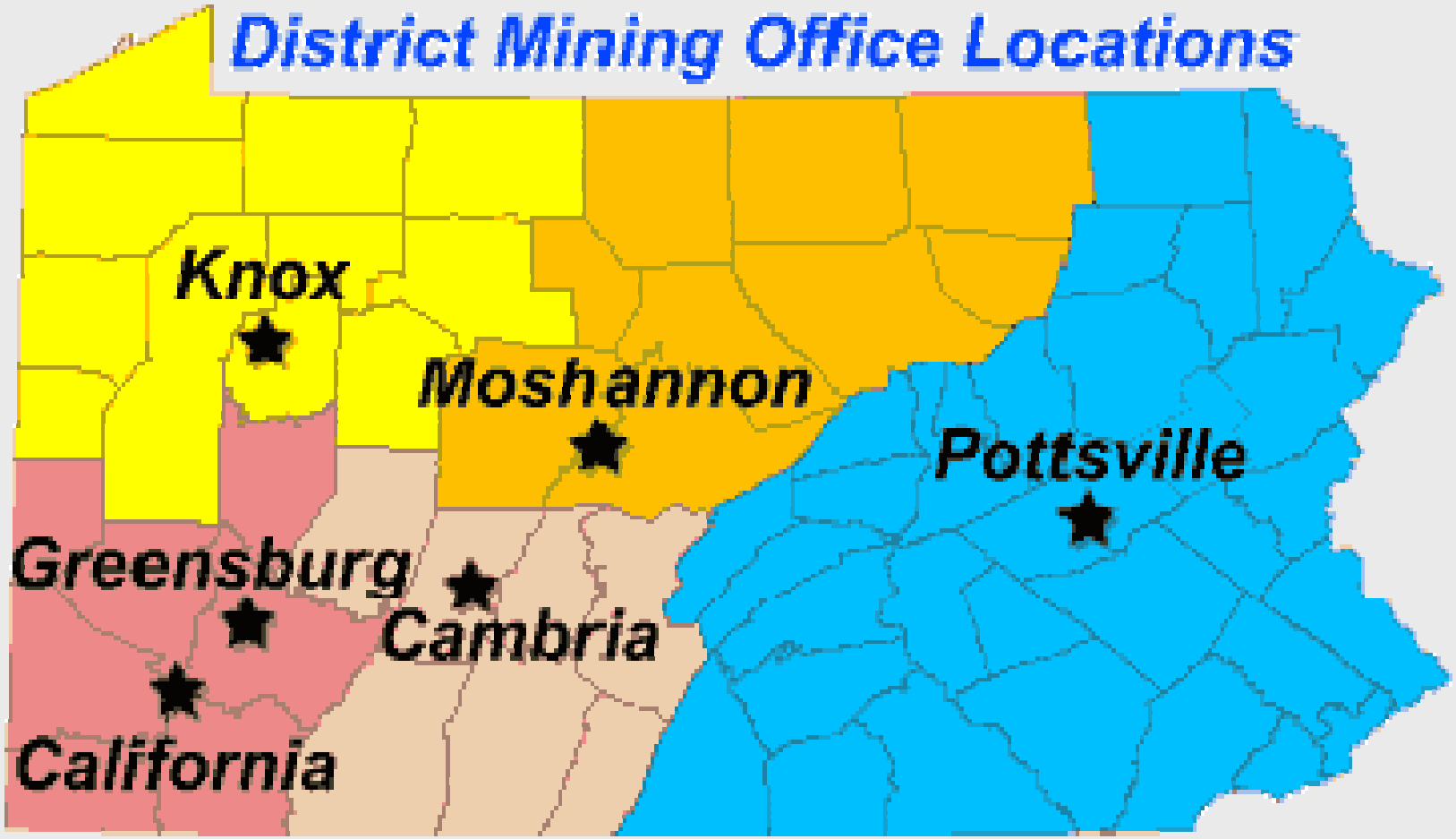
Commonwealth of Pennsylvania
Department of Environmental Protection
District Mining Operations
State Wide Summary Report

Period from 1/1/1998 to 2/10/2005

	Highwall Elimination	Acreage Reclaimed	Project Value	Commonwealth Cost
GFCC's *	6.82	780.59	$4,508,790.00	$0.00
Misc. Reclamation Projects	1.06	53.00	$445,800.00	$0.00
No Cost Contracts	0.21	132.80	$712,600.00	$0.00
Rec-in-Lieu of Civil Penalty	0.83	92.60	$1,123,187.38	$875,857.00
Remining Program *	107.75	14368.39	$95,893,987.03	$0.00
Surety Rec	1.44	1095.80	$13,883,256.37	$6,636,650.10
total	118.11	16523.18	$116,567,620.78	$7,512,507.10

Grand Total (summary of 564 projects)

* **Main programs discussed in this presentation**


District Mining Office Locations
Knox
Moshannon
Pottsville
Greensburg
Cambria
California

Pennsylvania Remining by District Office

	Miles of Highwall	Aacreage Reclaimed	Project Value
Ebensburg	32.73	2700.35	$7,999,477
Greensburg	10.21	1239.6	$6,696,849
Knox	28.92	1393.7	$10,341,763
Moshannon	32.96	2339.4	$10,129,598
Pottsville	2.03	6676.34	$60,711,900
Total	106.85	14349.39	$95,879,587

Federal and State Mining Programs 'Fit'

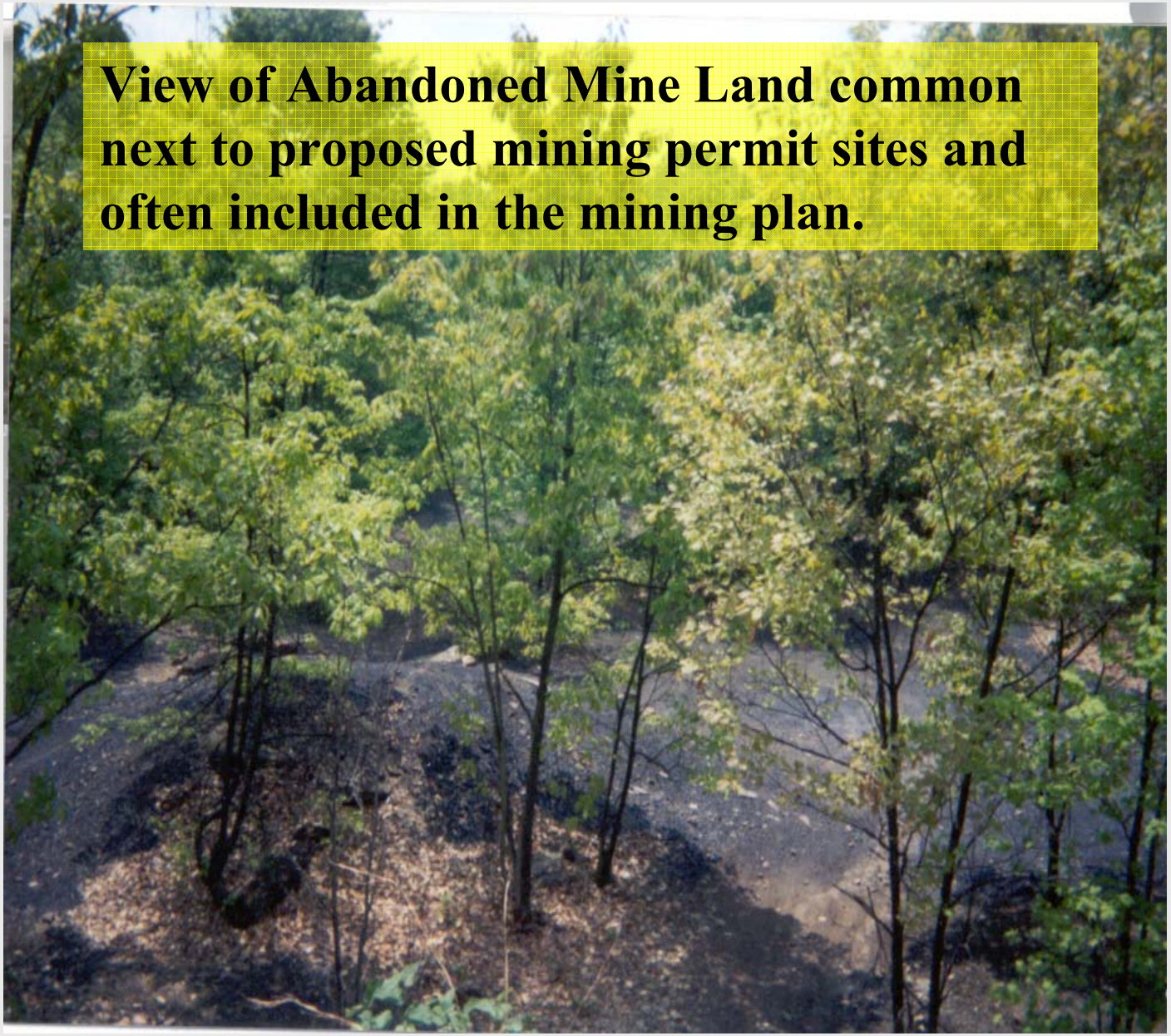
- SMCRA Title IV&V
- **GFCC's**
- Highwall 6.82 mi
- 780 Acres reclaimed
- Value $4,508,790
- State Cost $0.0

- SMCRA Title IV
- PA Title 25 Chapter 87
- **'Regular Permit' (ROAP) (SOAP)(SUB-F)**
- Financial Guarantees
- Highwall 107.75 mi
- 14,368 acres reclaimed
- Value $95,893,987
- State Cost $0.0

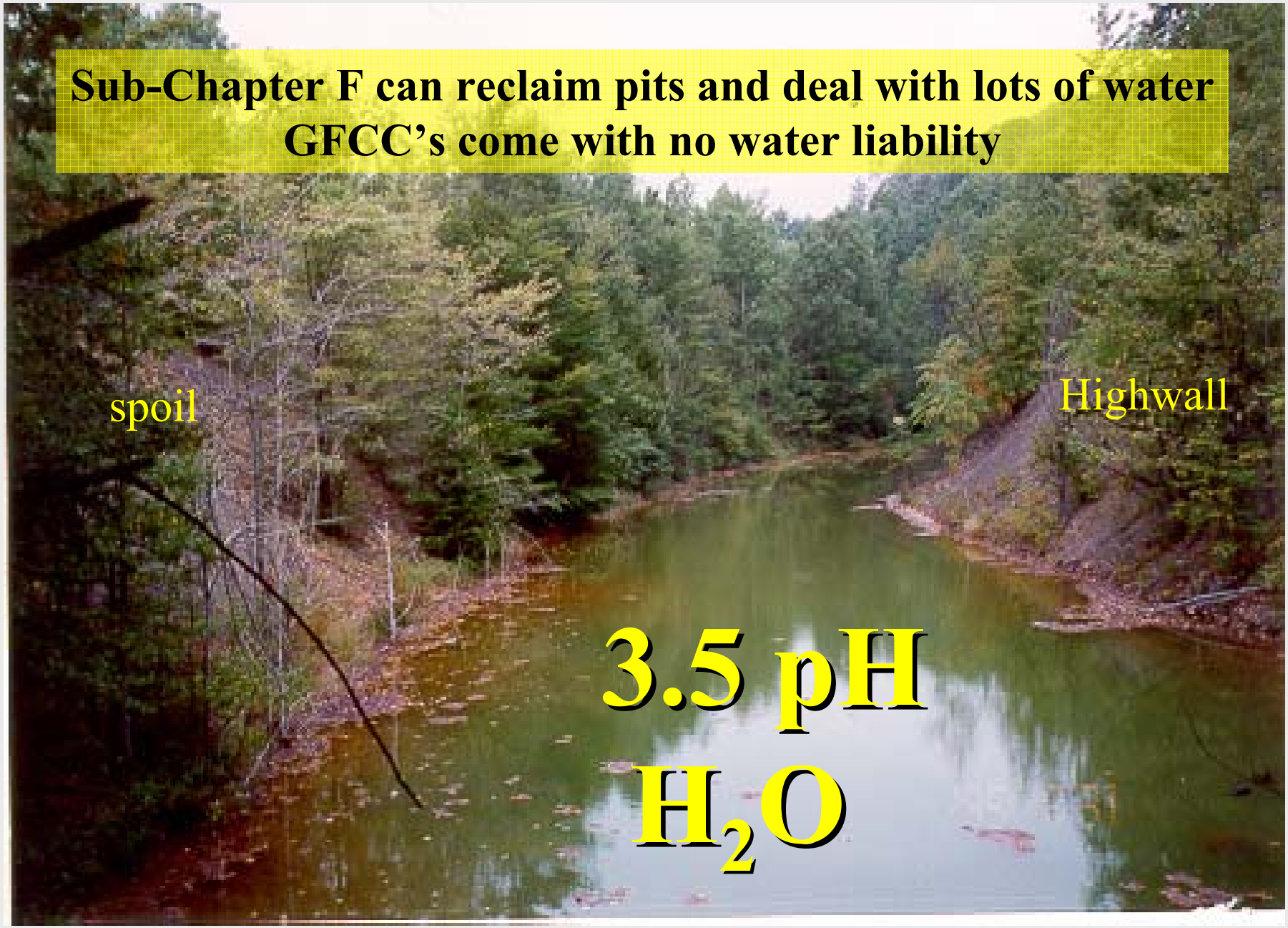
Differences in programs

- **GFCC**
- Contract
- Coordination between BAMR OSM and DMO
- Barriers are treated differently
- No water liability
- Limited in Arial Extent
- Performance bond

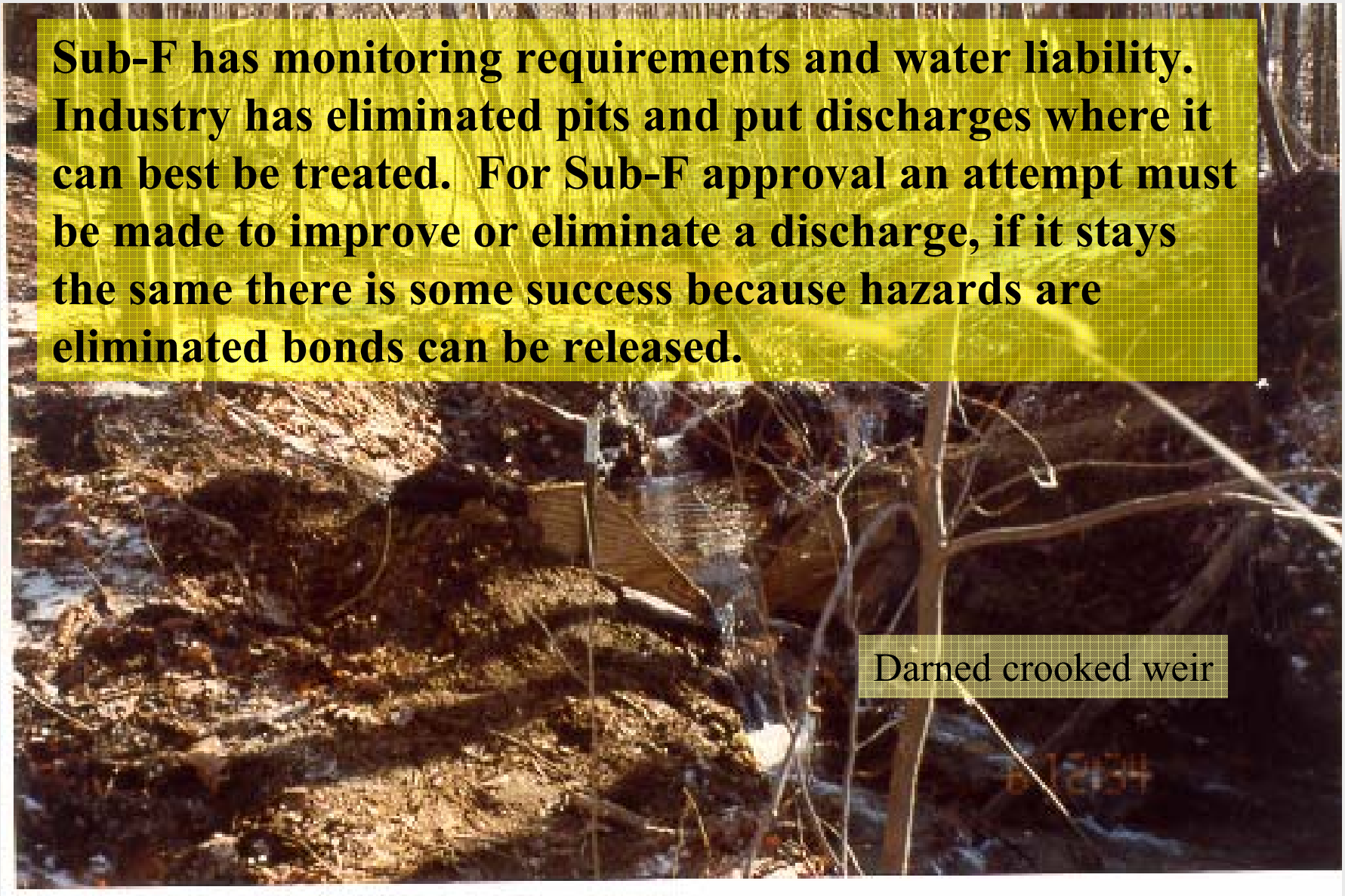
- **Sub-F or regular SMP**
- Only DMO review
- Large Data Volume Requirements
- Water liability
- Large acreage available
- Penal bond


View of Abandoned Mine Land common next to proposed mining permit sites and often included in the mining plan.

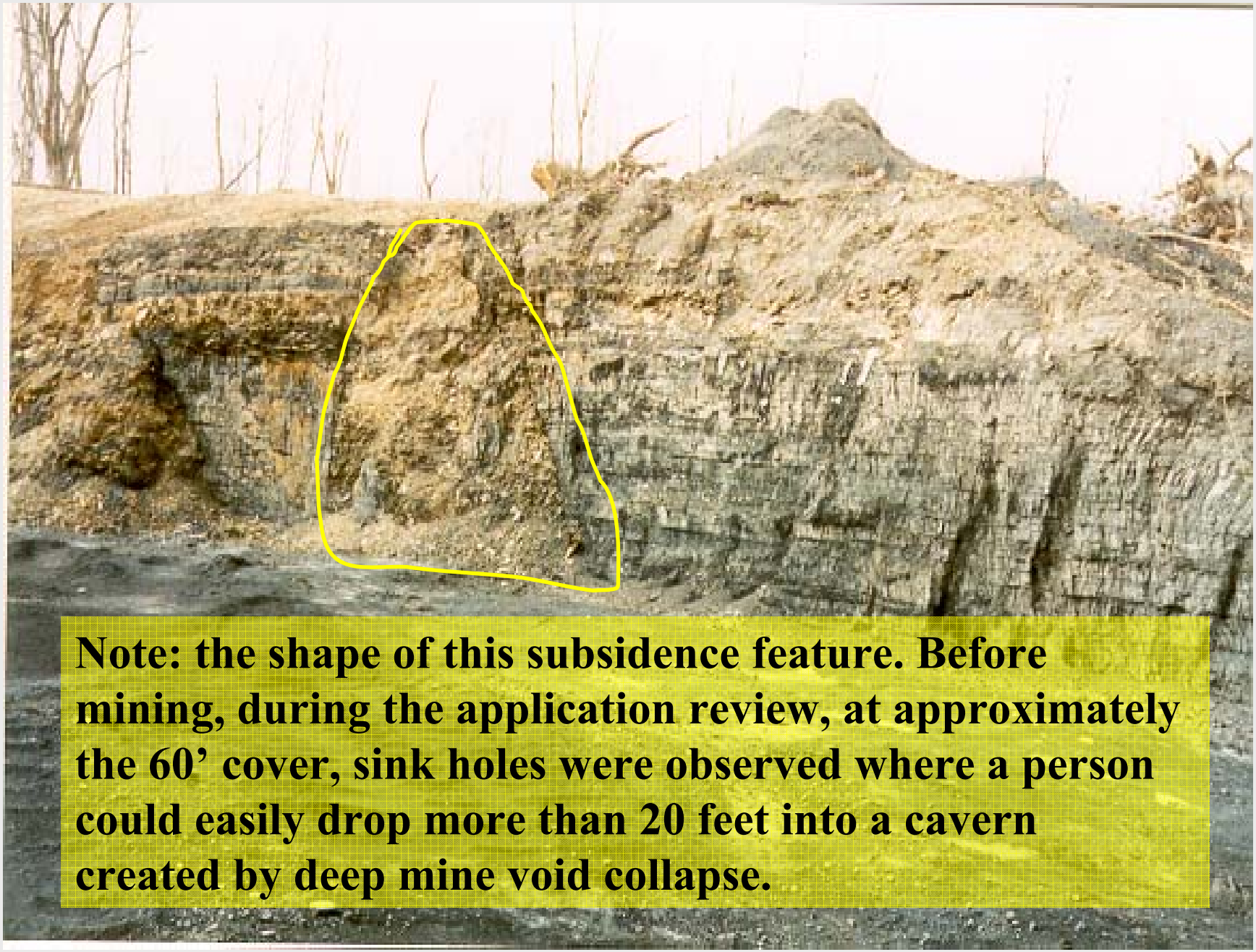

Site may have bottom coal.
Stacked coal seam configurations may allow E&S controls to occupy lower abandoned areas gaining reclamation where no activity was planed.


Sub-Chapter F can reclaim pits and deal with lots of water
GFCC's come with no water liability
spoil
Highwall
3.5 pH
H_2O

Sub-F has monitoring requirements and water liability. Industry has eliminated pits and put discharges where it can best be treated. For Sub-F approval an attempt must be made to improve or eliminate a discharge, if it stays the same there is some success because hazards are eliminated bonds can be released.



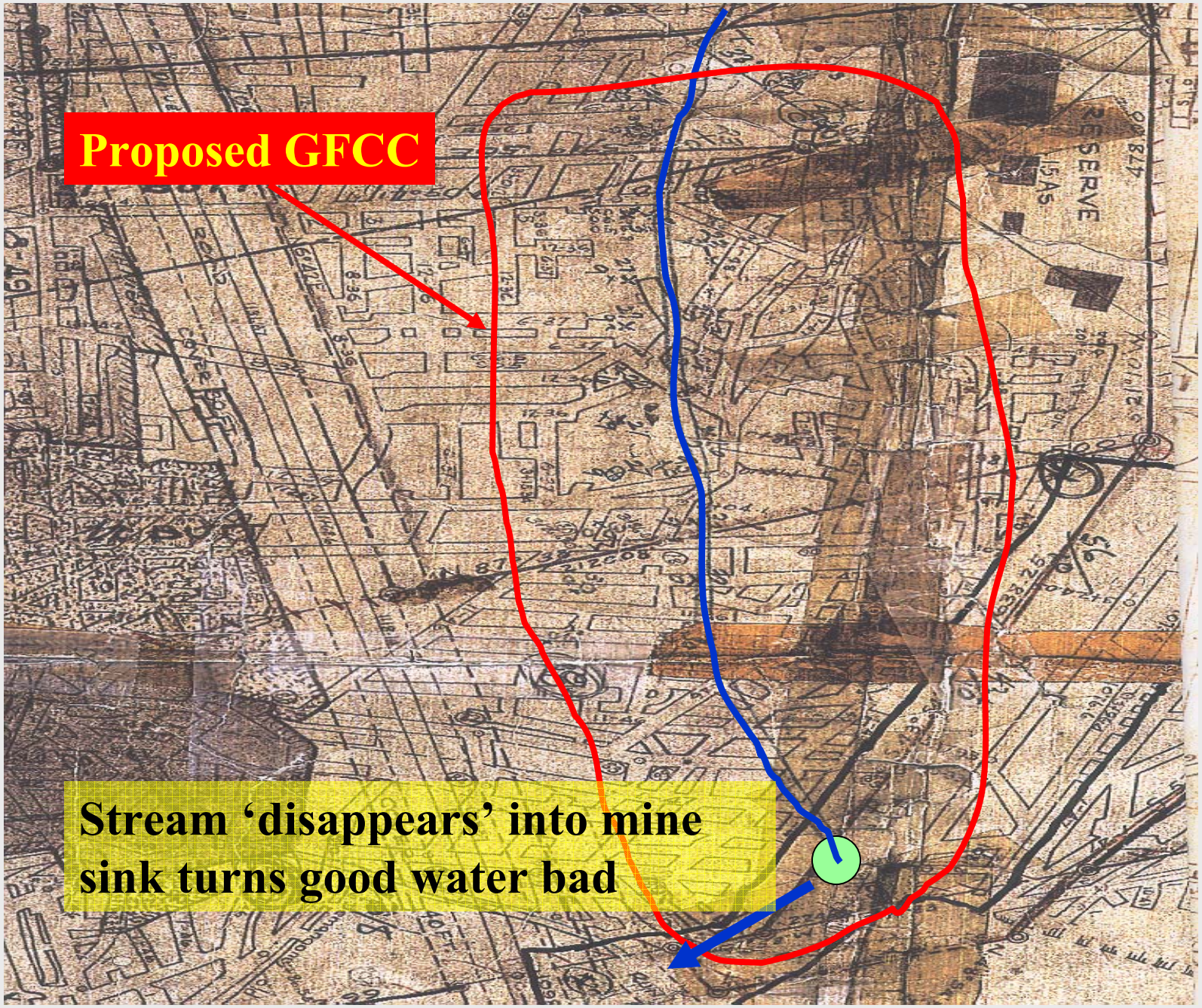

Significant Down slope erosion has been improved by re-vegetation and drainage control at re-mined sites.
'94 10 3


Note: the shape of this subsidence feature. Before mining, during the application review, at approximately the 60’ cover, sink holes were observed where a person could easily drop more than 20 feet into a cavern created by deep mine void collapse.


Vector and waste areas are reclaimed or converted to productive varied wetland habitats.


Re-use of land that cannot be
tilled is now put back into production.


Fluctuating mine pool and deepmine opening exposure eliminated


Proposed GFCC
Stream ‘disappears’ into mine sink turns good water bad


Shallow cover subsidence prone residential
and industrial development settings as well as
farmland field sinks have been eliminated where
there is enough coal for a permit or obvious
subsidence features for a GFCC.


Infiltration is reduced for water and oxygen.

Combination projects work well but usually require more paperwork that must be pushed through the system to get timely results.

These projects were published for public comment as well. People surrounding sites are not necessarily for the projects because of the disruption to their quiet, usually retired life. But they are willing to put up with it so reclamation can happen much sooner than normal funding would allow the State to reclaim.

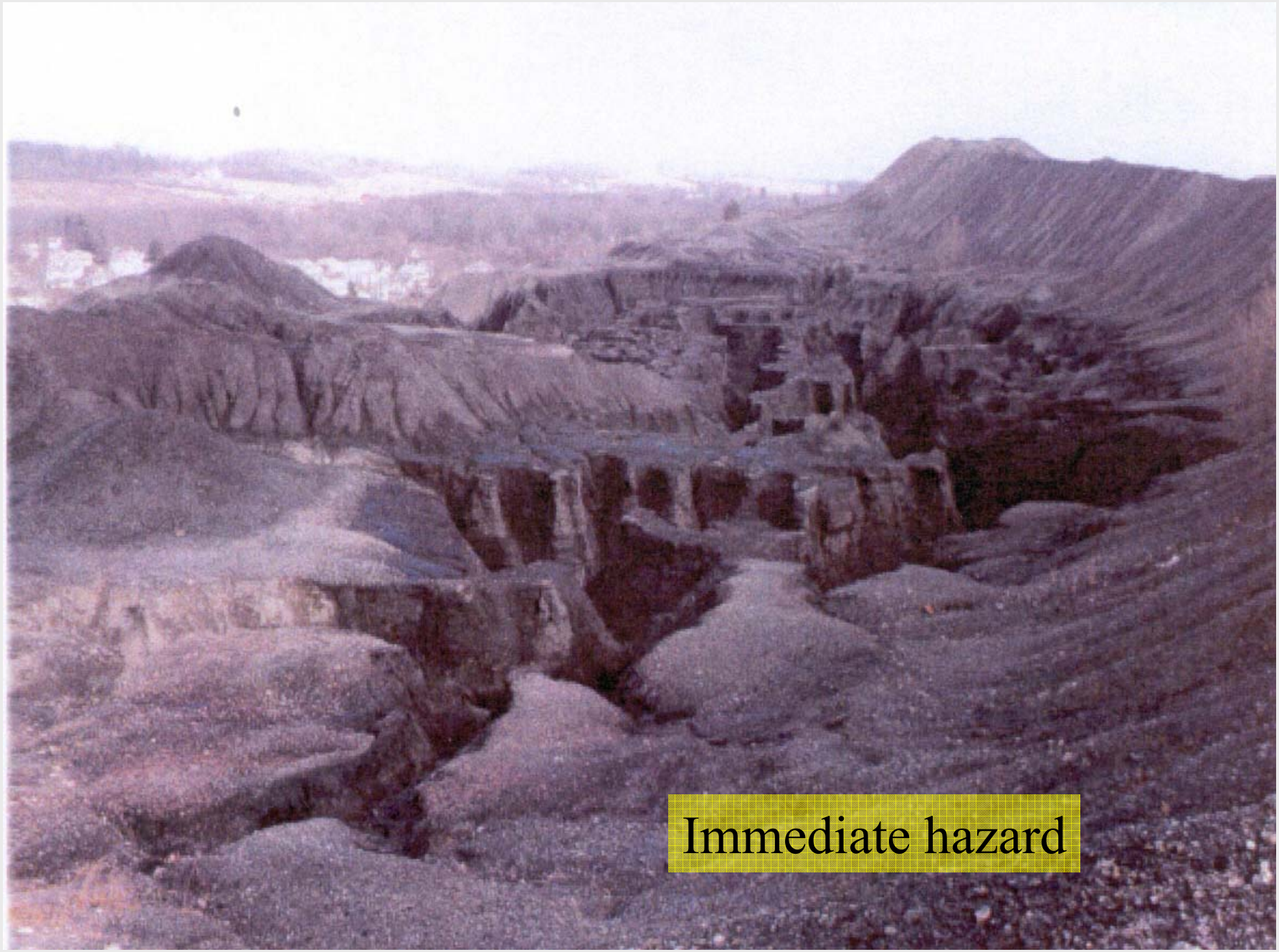
Two projects underway using combined regulatory programs are:

Mather Recovery Systems
GFCC/ growing greener co-funding and BAMR grant funding

Wynn Washeries
Combines Permit/contract/BAMR Act 181 Landowner reclamation funding from forfeiture

Large scale projects require support of the local elected officials as well DEP top management. And don't forget the most important participant, a willing private sector Businessperson to take on the risk.

Mather Recovery Systems
GFCC/ BAMR grant funding


Immediate hazard


Hazard reduced

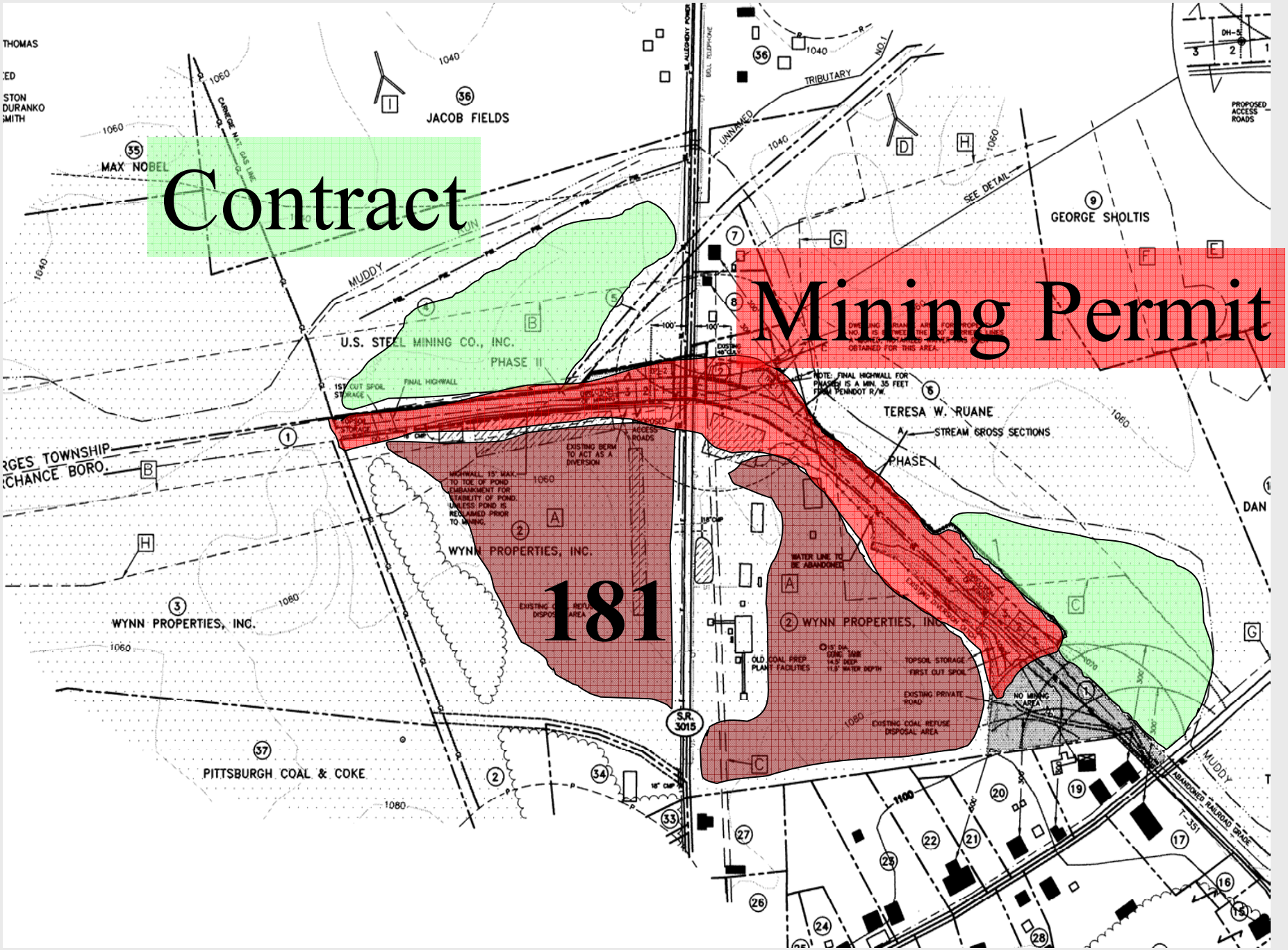

DANGER
NOTICE

The Wynn Wash plant was a deep mine slope opening processing plant supplied with Pittsburgh Coal in the H.C. Frick Coal (later U.S. Steel) Basin in PA. It is a smaller project than Mather but good results were achieved using a combination approach to reclamation.

A permit was issued for mining a railroad grade bisecting the site underlain by solid coal.

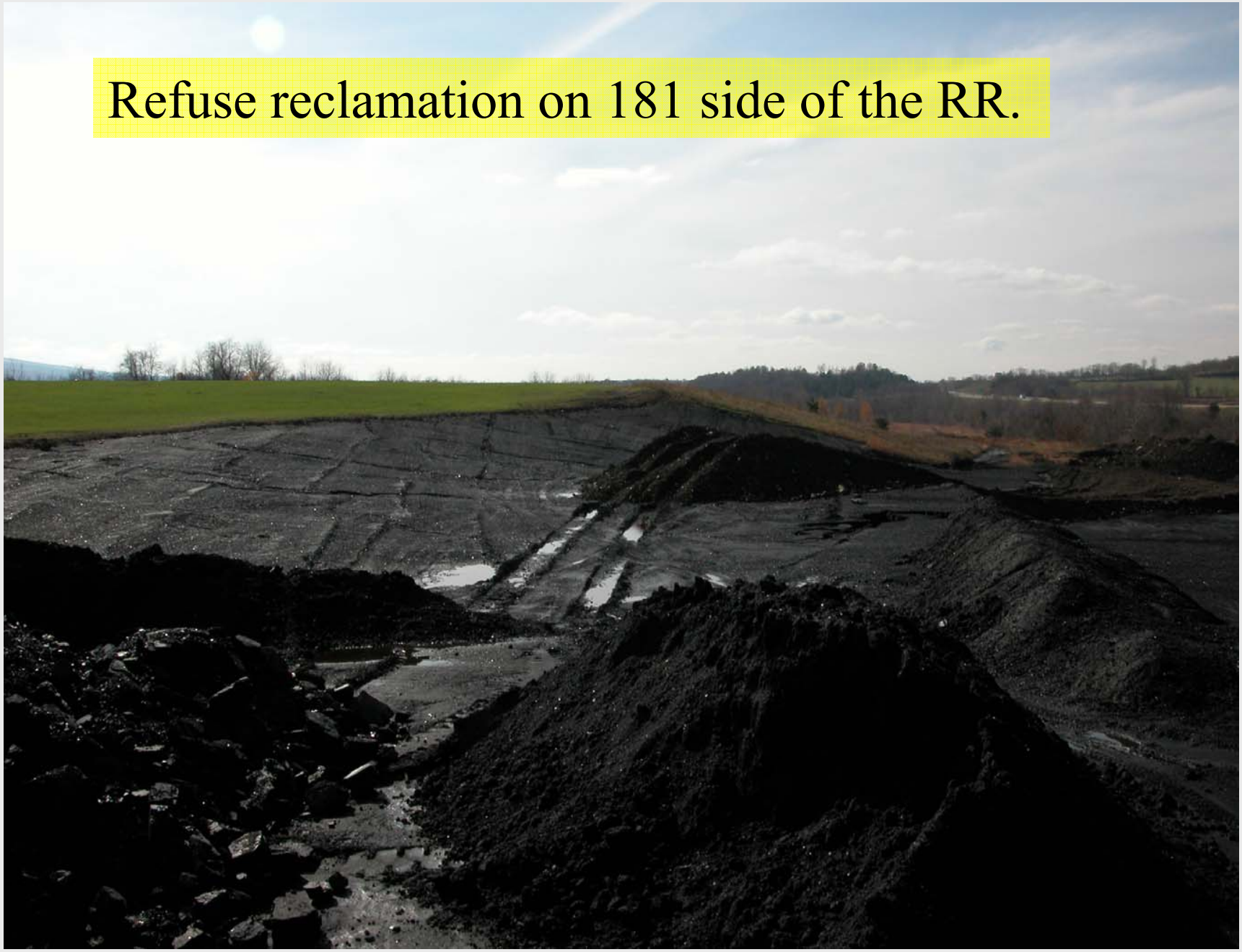
In adjacent areas very little re-mining was available due to past surface and deep mining. No funding was available for the surface reclamation outside the railroad boundary. With no funds available to reclaim the surface, a contract was written for that area.

Where a Reprocessor was trying to work the old gob at the washery, a small amount of bond was available and a 181 contract was let through BAMR for that portion of the site.


Contract
Mining Permit
181
JACOB FIELDS
MAX NOBEL
GEORGE SHOLTIS
TERESA W. RUANE
U.S. STEEL MINING CO., INC.
PHASE II
PHASE I
WYNN PROPERTIES, INC.
PITTSBURGH COAL & COKE
STREAM GROSS SECTIONS
EXISTING BERM TO ACT AS A DIVERSION
EXISTING COAL REFUSE DISPOSAL AREA
OLD COAL PREP PLANT FACILITIES
TOPSOIL STORAGE
FIRST CUT SPOIL
EXISTING PRIVATE ROAD
NO MINING AREA
S.R. 3015
TRIBUTARY
UNNAMED
MUDDY
SEE DETAIL


Contract Area note: no top soil

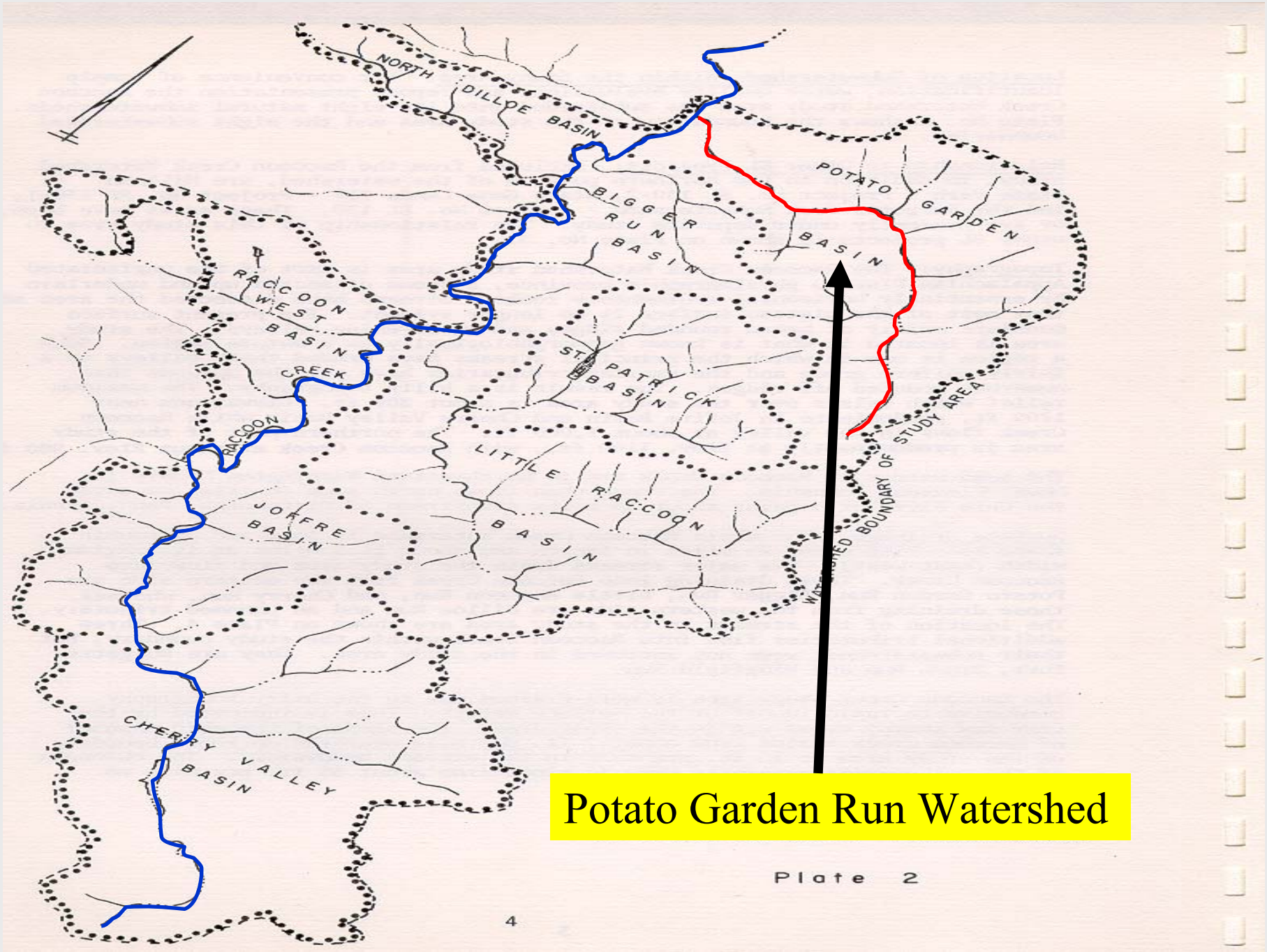
Refuse reclamation on 181 side of the RR.

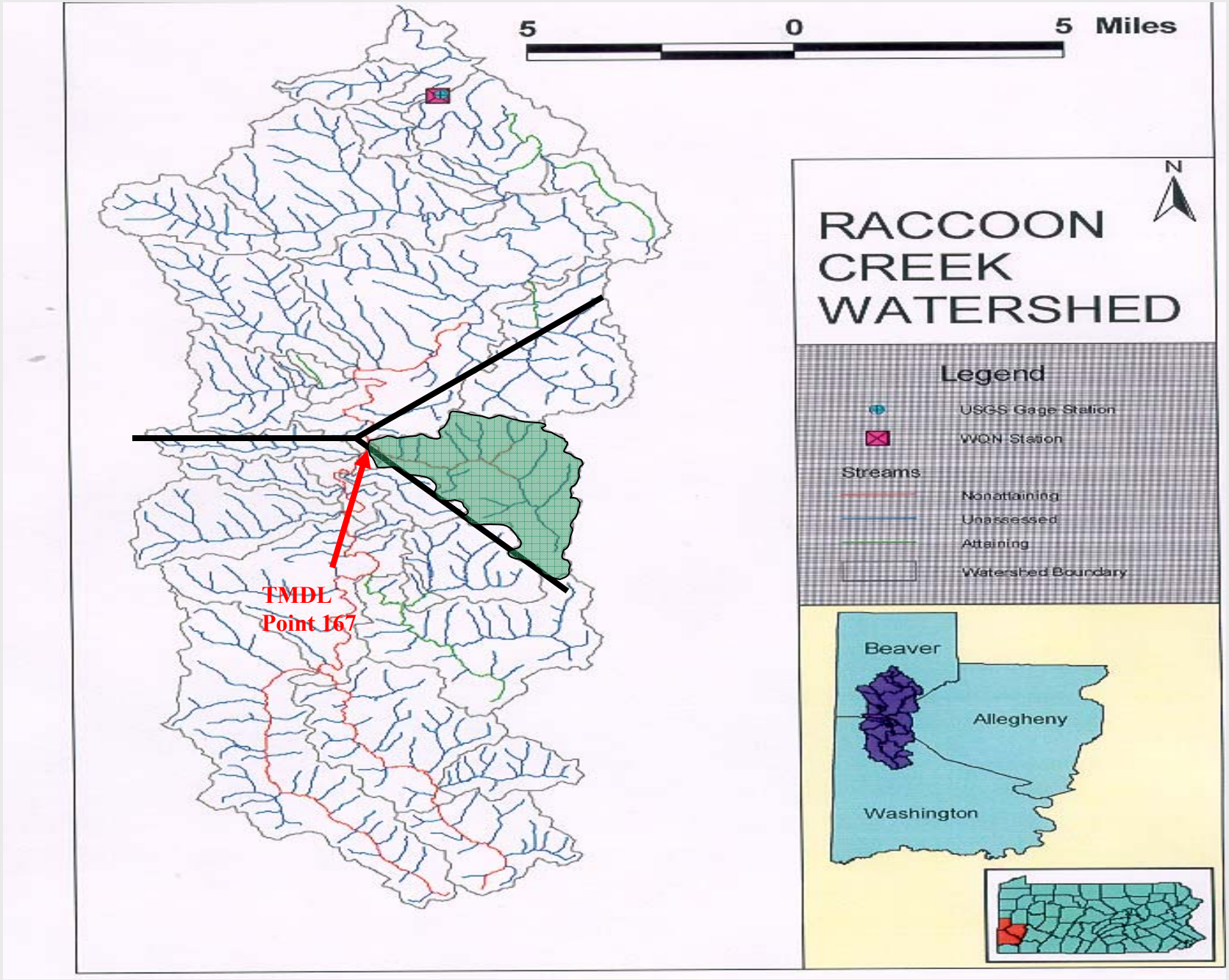


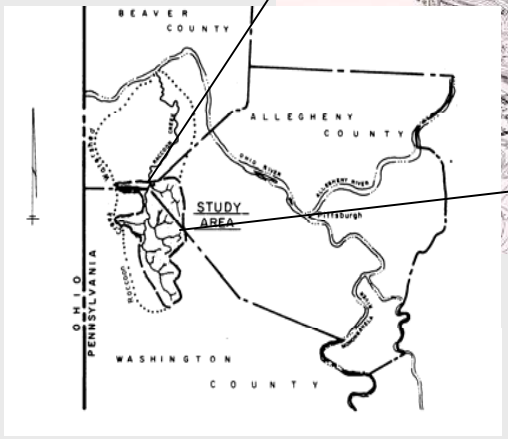

NOTE: this project is complete updated photo to come…

Remining with SMPs
SUB-F

- Remining using regular mining permits is the most robust program.
- Remining unreclaimed areas can be added to an existing project at lower cost with economies of scale making reclamation feasible.
- Sub-Chapter F permits are risky for climatologic and statistical reasons but work well if water is managed properly on site and the site conditions prevent hydrologic isolation or deep mine elimination.


NORTH DILLOE BASIN
BIGGER RUN BASIN
POTATO GARDEN BASIN
RACCOON WEST BASIN
CREEK
RACCOON
ST. PATRICK BASIN
LITTLE RACCOON BASIN
JOFFRE BASIN
CHERRY VALLEY BASIN
WATERSHED BOUNDARY OF STUDY AREA
Potato Garden Run Watershed
Plate 2
4


5 0 5 Miles
N
RACCOON CREEK WATERSHED
Legend
USGS Gage Station
WQN Station
Streams
Nonattaining
Unassessed
Attaining
Watershed Boundary
TMDL Point 167
Beaver
Allegheny
Washington



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

20

CLINTON QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)

EXPLANATION

Crop line of the Pittsburgh coal

Extent of known strip mining

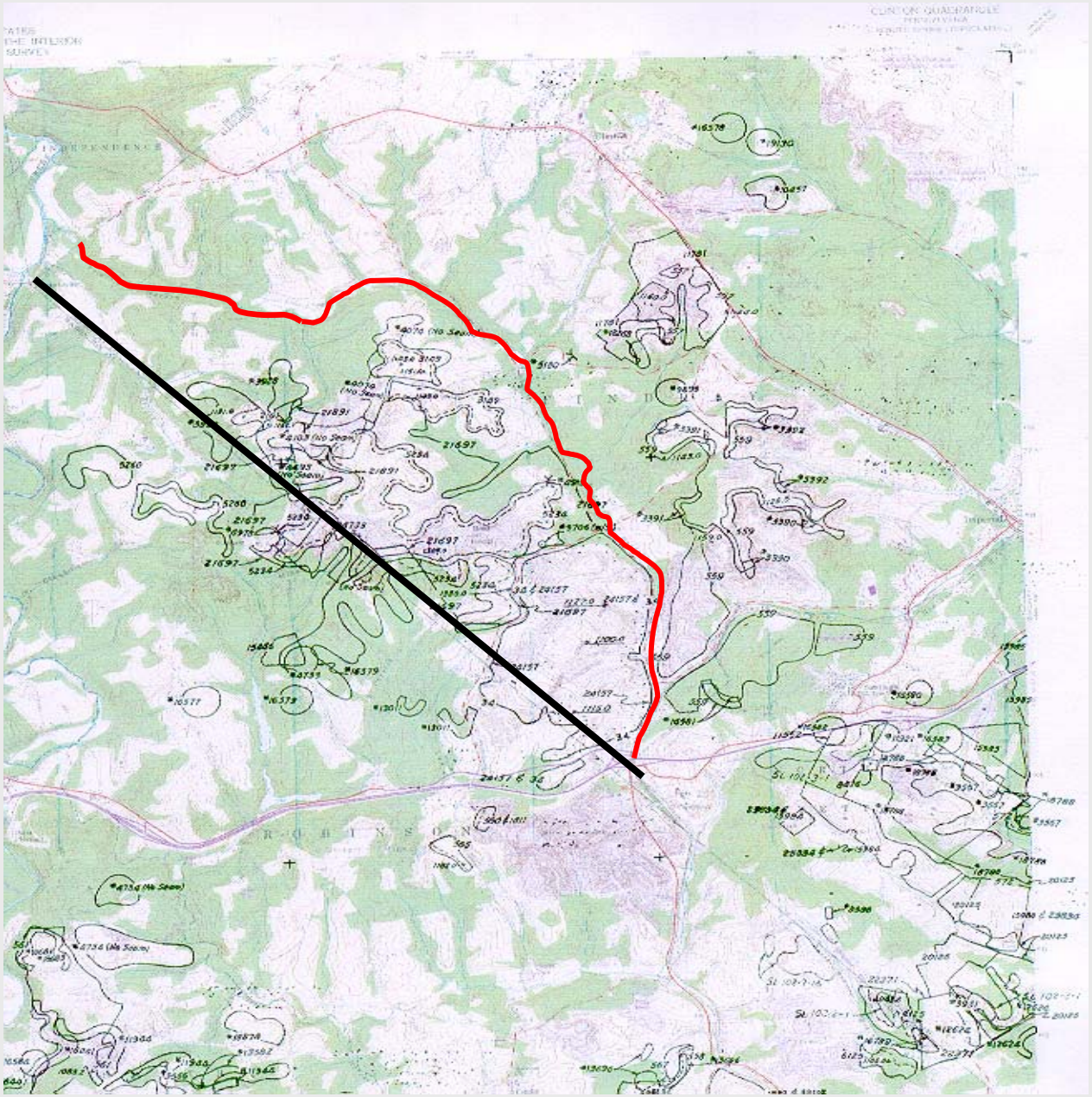
Extent of known deep mining

INDEPENDENCE

HANOVER

ROBINSON

NORTH FAYETTE


CLINTON QUADRANGLE
PENNSYLVANIA
INDEPENDENCE
ROBINSON

7.1b GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

ole No.		TH-2	Operation Name:	Stefkovich-Horrichter
urface Elevation:		1015.11	Method of Drilling:	Air-Rotary
ottom of Coal Elevations	Pgh.Coal	951	Date Drilled	9/3/86
			Drilled By:	Stefkovich
			Logged By:	R.W. Anderson
roundwater Elevations	964.11	964.61	Township	Cross Creek
nd Date Measured	9/3/86	9/6/86	County	Washington
			Quadrangle	Avella
			Remarks:	

epth	Thick-ness	SCALE	Graphic Log	Lithologic Description and Water Conditions	OBA Analysis No.	Log Interval	% Total Sulfur	% Pyritic Sulfur	Fizz Rating	Neutralization Potential	Official Use Only
4	4			Soil, claystone-shale derived	1	0-4	<		0±	+ 9.00	
				Shale-claystone, weathered, becoming sandy near bottom.	2	4-7	<		0	+ 6.75	
11	7	10			3	7-11	<		0±	+ 9.25	
					4	11-14	<		0	+ 4.25	
				Sandstone, weathered, slightly calcareous at bottom	5	14-17	0.11		0±	+ 6.25	
20	9	20			6	17-20	<		1+	+ 8.00	
				Sandstone, very calcareous, possible with limestone upper 2 feet. Med. grained, hard.	7	20-22	<		4+	+122.50	
					8	22-24	<		3+	+33.38	
27	7				9	24-27	<		4+	+63.13	
				Sandstone, weathered, yellow-brown, not as calcareous	10	27-30	0.12		1+	+16.25	
		30			11	30-33	<		1+	+ 7.75	
36	9				12	33-36	0.06		0±	+21.75	
				Sandstone, not weathered, calcareous, medium grained.	13	36-39	<		3+	+59.38	
43	7	40			14	39-43	0.20		1+	+28.00	
				Sandstone, non-calcareous, possibly with some shale clasts. DAMP	15	43-47	0.17		0	+ 1.25	
					16	47-50	0.26		0	+ 0.50	
52	9	50			17	50-52	0.37		0	+ 3.00	
				Sandstone, with carbonaceous shaly clasts & claystone with rashy coal at bottom.	18	52-54	0.80	0.61	0	+ 7.75	
					19	54-59	1.33	0.87	1+	+ 8.00	
59	7									* See below	
64	5	60		Main Pittsburgh Coal Bench	20	59-64	2.88	1.19	0	- 2.00	
65	1			Lime-claystone mixed with coal chippings from above.	21	64-65	14.49	3.90	3+	+ 115.13	
			TD								
		70									
				* The following samples were taken from non-weathered section of exposed roof, directly above coal.	SS-1	Direct above coal 7-3	<0.05		0	+ 0.63	
		80			SS-2		<0.05		0	+ 0.38	

Station	Parameter	Existing Load (lbs/day)	TMDL Allowable Load (lb/day)	WLA (lbs/day)	LA (lbs/day)	Load Reduction (lbs/day)	*Percent Reduction %
167	Mouth of Potato Garden Run						
	Al	0.5	0.5	NA	NA	0.0	0
	Fe	9.1	9.1	NA	NA	0.0	0
	Mn	27.1	8.9	0.0	8.9	18.2	67
	Acidity	266.2	266.2	NA	NA	0.0	0
	Alkalinity	1963.7					
	Alkalinity	635.0					

NA meets water quality standards. No TMDLs necessary.
WLA = point source loads
LA = total nonpoint loads entering segment, including any upstream loads
*Reduction required after upstream reductions are made

PADEP allocated wasteloads to five permitted discharges. Table 4 below presents a summary of the WLAs for the Raccoon Creek Watershed. Where there are active mining operations or post-mining discharge treatment in the watershed, Federal regulations require that subsequent to TMDL development and approval, point sources permitted effluent limitations be

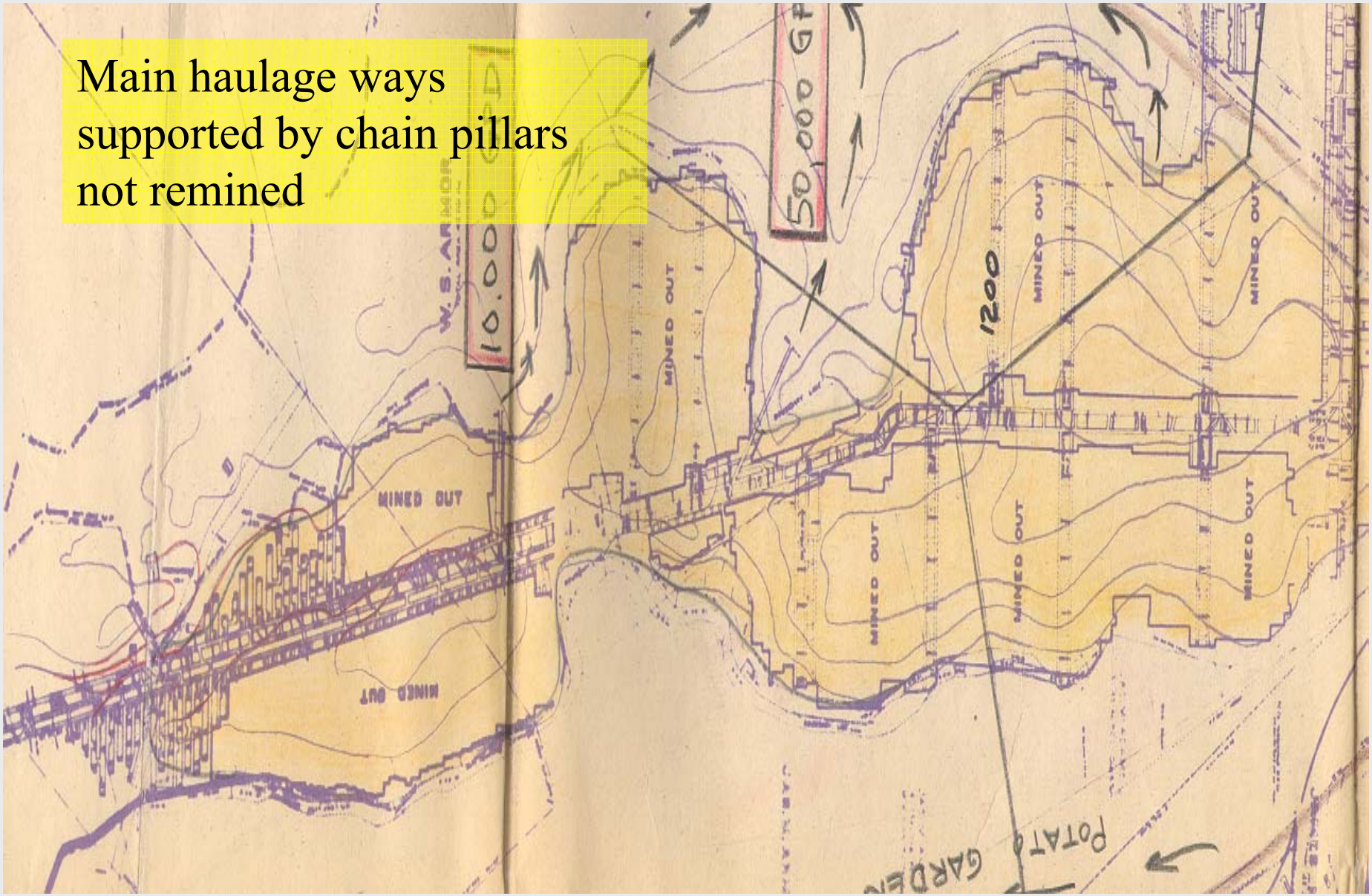
SR-54 Water Quality Analysis	Maximum	Minimum	Average
pH	3.1	2.6	2.8
Flow (gpm)	8,988	343	1,596
Acidity (mg/l)	1,940	52	1,047
Total Iron (mg/l)	426.4	6	191.4
Ferrous Iron (mg/l)	93	0	11.9
Sulfate (mg/l)	3,250	1,400	2,210
Net Acid Load (lbs/day)	123,060	1,150	19,870

PG-26 Water Quality Analysis	Maximum	Minimum	Average
pH	4.4	2.5	2.8
Flow (gpm)	1,530	150	503
Acidity (mg/l)	2,760	98	1,490
Total Iron (mg/l)	708.5	4.7	403
Ferrous Iron (mg/l)	616	0	161
Sulfate (mg/l)	4,200	1,525	2,430
Net Acid Load (lbs/day)	28,110	212	10,280

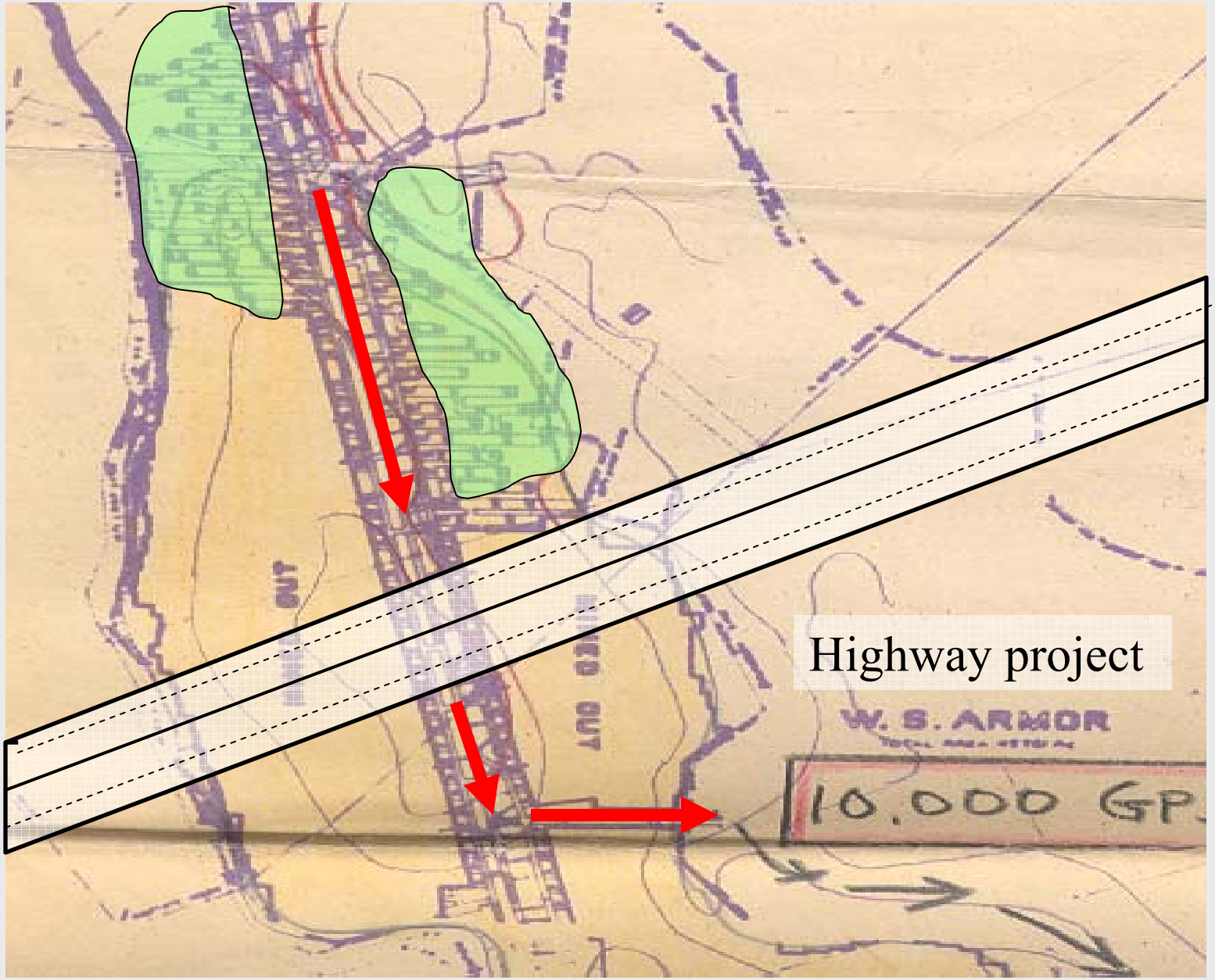
PG-30 Water Quality Analysis	Maximum	Minimum	Average
pH	3.0	2.7	2.8
Flow (gpm)	59	19	37
Acidity (mg/l)	5,500	1,500	2,715
Total Iron (mg/l)	495	80	220
Ferrous Iron (mg/l)	125.4	0	62.7
Sulfate (mg/l)	8,750	3,000	4,350
Net Acid Load (lbs/day)	1,640	700	1,080

NOTE: Same Pond before and after remining.

All of the farmland shown has been remined up to the trees. Ridges unmined usually chain pillars and haulage ways still intact over 150’cover.


Main haulage ways
supported by chain pillars
not remined
MINED OUT
MINED OUT
MINED OUT
MINED OUT
MINED OUT
MINED OUT
MINED OUT
1200
10,000
50,000

Permits have been used to remine and successfully reclaimed large parcels of land.


Highway project
W. S. ARMOR
10,000 GP

$7,512,507 spent for reclamation by the Commonwealth.

$88,367,080 net value of abandoned mineland reclaimed.