Abandoned Mineral Mining Inventory Protocol

Prepared for the Virginia Department of Conservation and Recreation

Virginia Department of Mines, Minerals, and Energy
Division of Mineral Mining

April 15, 1997
Revised January 2001
Revised June 2003

Table of Contents

1. Introduction

Extraction of minerals from the earth has been occurring in Virginia since pre-colonial times. Early mining was accomplished in the Austinville area of Wythe County, which was a prominent source of lead from the Civil War to the 1960's. Other minerals obtained in Virginia include barite, copper, gold, iron, manganese, mica, silver, and titanium. Currently over 77,000,000 tons of non-coal minerals are mined annually in Virginia.

Legislation passed in 1968 by the General Assembly has helped minimize the adverse effects of mining on the environment by requiring sites to be reclaimed. Sites that were last mined before 1968 are not covered by legislation and are termed "Orphaned Land." According to a study by the U.S. Soil Conservation Service over 10,000 acres of land in Virginia can be categorized as orphaned lands. These sites have a variety of problems associated with them that pose threats to the environment. These problems include:

* Severe gully erosion
* Acid drainage
* Acid soil conditions
* Poor vegetative growth
* Eyesore to community
* Trash dumps
* Toxic waste dumps

One of the attractive environmental benefits offered by reclaiming abandoned mineral mine sites is the potential for wetlands development. At various sites, hydrological conditions exist that will promote the sustenance of plant species that exist as wetlands. Reclamation plans have been designed by DMM that expand the acreage of wetlands in Virginia and foster habitat for desirable life forms.

2. Orphaned Land Program

The Orphaned Land program had its beginnings with legislation that was passed in 1978. This legislation created the Mineral Reclamation Fund, which is a State managed industry self-bonding program. Operators pay into the fund based on the number of acres disturbed by their operation and receive money back after their lands have been reclaimed. Funding to reclaim lands that existed before 1968 consists of interest from the Mineral Reclamation Fund.

Sites are identified through complaints from local citizens, identification by DMME field staff or by watershed using the NPS Protocol. Identified sites are investigated using an evaluation system that converts site characteristics into three (3) numerical scores that represent environmental, safety, and exposure concerns. Once a year the sites investigated are presented to an orphaned land advisory committee (OLAC) for evaluation and prioritization of the order of reclamation. This committee consists of individuals from the Division of Mineral Resources, the mineral mining industry, Virginia Polytechnic Institute and State University, the Department of Transportation, the U.S. Natural Resources Conservation Service, the Department of Environmental Quality, and private citizens. Based on the recommendation of the OLAC committee, further studies will be conducted at the site, reclamation plans developed, and reclamation of the sites contracted out via a public competitive bid contract.

3. NPS Protocol

In order to better integrate reclamation of mineral mines with the state's Nonpoint Source (NPS) pollution program, a protocol has been developed which incorporates information that is important to the NPS program with the investigation of orphaned lands. This protocol will also allow for comprehensive, systematic investigation of mines sites based on Virginia's high priority NPS watersheds. The steps followed for this protocol are as follows:

1. Watershed Identification
2. Location Information
3. Literature Review
4. Site Investigation Planning
5. Site Investigation
6. Data Entry
7. OLAC Ranking
8. Reclamation

3.1 Watershed Identification

Watersheds are identified for investigation from the Department of Conservation and Recreation most recent Biennial NPS Pollution Water Quality Assessment report. Watersheds that have high NPS pollution potentials are selected from the report. Selections are made from the high priority watersheds based on DMME/DMM knowledge of orphaned lands. The Department of Environmental Quality TMDL priority list is another source, where mining is listed as a contributing factor, used to select watersheds.

As data is compiled using the inventory process, results are maintained in electronic format. The files are distributed to other state/federal agencies as required. The data is suitable for transfer to a Geographic Information System (GIS) format.

3.2 Location Information

When a watershed(s) has been selected for investigation, the mines in that watershed are identified and located. This step involves locating mine sites on hard copy USGS 1:24,000 topographic maps using the Virginia Hydrologic Unit Atlas. Delineation of the watershed on the various topographic maps can be accomplished by locating common features that the watershed boundary follows on the topographic maps, locating watershed divides as indicated by contour lines pointing downhill, and locating ridge tops that the watershed boundary would follow on the topographic maps.

Mine sites can be located using different methods. Mine site latitudes and longitudes can be obtained from either the Mineral Resources Data System (MRDS) or the Mineral Industry Location System (MILS) databases and then used to place locations on the topographic maps using a longitude-latitude ruler. Directions and distances for

locating mine sites can also be obtained from the Location Comments field in the MRDS database. Some of the larger sites may already be indicated on the topographic maps by a mine symbol, thus speeding the process of locating them. Mine sites may also be located from the DMM Abandoned Permit database.

3.3 Literature Review

Many of the larger sites in the state with recorded production have been investigated for their geologic characteristics and described in publications by the Virginia Department of Mines, Minerals, and Energy, Division of Mineral Resources (DMR) and the USGS. In many instances, these sources contain detailed maps of mined areas which can be very helpful in locating mine features once on site and descriptions of mining activities which can aid in determining the extent of the mining and the hazards which may still exist at the site. Publications by these agencies generally group information by commodity or by geographic area of the state. Some publications which have proven useful thus far include the following:

Area

Epenshade, G. H., 1954, Geology and mineral deposits of the James River-Roanoke River manganese district, Virginia: U. S. Geol. Survey Bull. 1008, 115 p.

Gathright, T. M., II, Henika, W.S. and Sullivan, J. L. III, 1978, Geology of the Crimora quadrangle, Virginia: Virginia Division of Mineral Resources Publication 13, text and 1:24,000 scale map.

Nelson, W. A. 1962, Geology and Mineral Resources of Albemarle County: Virginia Division of Mineral Resources Bulletin 77, 92 p.

Rader, E. K., and Webb, H. W., 1979, Geologic factors affecting land modification, Warren County, Virginia, Publication 15, text and 1:50,000 scale map.

Commodity

Sweet, P. C. and Rowe, W. W. Jr., 1984, Selected Virginia mineral - resource information: Virginia Division of Mineral Resources Publication 51, 28 p.

Sweet, Palmer C., Richard S. Good, James A. Lovett, Elizabeth V. M. Campbell, Gerald P. Wilkes, and Lesley L. Meyers. Copper, Lead, and Zinc Resources in Virginia. Virginia Division of Mineral Resources. Publication 93. Charlottesville 1989.

Watson, T. L. 1907, Mineral Resources of Virginia: J. P. Bell and Company, Lynchburg, Va., 618 p.

3.4 Site Investigation Planning

Prior to going out into the field, the topographic maps that have the mine sites plotted on them should be examined to determine the order to visit sites in. The order should be selected based on their proximity to accessible roads, proximity to each other, and the magnitude of the likely environmental impacts at the site. Generally, sites listed as mines in the databases will have larger impacts than those described as prospects, though some sites may be listed as both a mine and a prospect depending on the database examined.

Proper site investigation planning also involves having all necessary supplies available at the time of the investigation. A brief list of supplies that should be maintained during a trip includes:

- Record/log book with pages treated for wet weather work
- Digital camera or film camera w/slide film
- Camera batteries
- Writing instruments (pens and pencils)
- Compass/Global Positioning (GPS) unit
- Sampling equipment for pH, conductance, and temperature
- First-aid kit

These supplies should always be checked and restocked prior to leaving for an investigation so a portion of the investigation will not need to be repeated.

3.5 Site Investigation

The goal of the site investigation is to document the condition of the site so it can be ranked for reclamation by OLAC. This goal is achieved by recording descriptive information about the site on the Orphaned Mined Land Site Inventory Report maintained in an electronic database on a DMME server computer. A copy of a sample report is included as Appendix A and Appendix B presents instructions for obtaining the data. The information collected at the site is compiled and reduced to the categories of Exposure, Environmental, and Safety Hazards. For each of these three categories, a numerical score is developed which indicates the magnitude of the problems at a site. The larger the numerical score the greater the problem at the site.

Site sampling at this stage consists of measuring pH, conductance, and temperature of waters in or draining from the site. This sampling is performed using digital measuring equipment capable of calibration with standard solutions. Based on site conditions, additional field sampling may include soil pH. If a stream is present in the area, observations will also be made on the presence of invertebrates in the stream as well as other aquatic life. Additional sampling will be performed if conditions indicate that other problems may exist. Some indicators which would precipitate the need for laboratory sampling would include:

Acidic drainage

Iron precipitate
Lack of invertebrates in stream
Lack of other aquatic life
Oily film on water
Presence of trash and debris
Presence of suspected toxic materials
Commodity mined
Processing which occurred at site.

Any of these conditions could prompt additional sampling, of varying degrees.

3.6 Data Entry

Once back from the site, data for the site should be entered onto the DMME computers within five working days of the site investigation. The data is entered on an Orphaned Mined Land Site Inventory Report now maintained in an electronic database on a DMME server computer. The data entry is accomplished over the World Wide Web using secure passwords.

3.7 OLAC Ranking

A meeting of the Orphaned Land Advisory Committee is convened once per year to evaluate and rank the Orphaned Land Sites investigated for the previous year. Slides of the sites are presented along with a summary report of the site investigation. Sites are voted on by Committee members and given rankings of A, B, or C, which represent the following:

A = Highest Priority, reclamation of all these sites occurs first
B = Medium Priority, reclamation occurs after all A sites are complete.
C = Low Priority, reclamation will occur after all A and B sites are complete or site naturally reclaimed.

All sites investigated using either the NPS watershed inventory system or through the complaint system utilize the protocol developed. Each mine will be ranked by OLAC independently based on its own merits and not on the number, or types, of sites which have been investigated for the year. All “A” priority sites will then be evaluated to ascertain if the problems associated with the site are environmental, public safety, or both. “A” priority sites will then be reclaimed based on cost of reclamation, exposure risk, severity of the problem, and other individual parameters. A minimum of $50,000 per year of available funds will be allocated to eliminating NPS pollution in priority watersheds. In addition, annual proposals for funding of watershed projects to the Environmental Protection Agency’s (EPA) NPS Pollution Abatement Program, as well as to other available grant programs will be submitted on selected projects/watersheds. Grant funds will be matched using either Orphaned Land Funds or available general funds.

3.8 Reclamation

After the OLAC ranking process is complete, reclamation work will begin on sites with an A rating first. The process for reclamation involves developing reclamation plans, competitively bidding the work, and then using the contract to complete the reclamation work. Before construction can begin, consents of entry to the site are obtained along with any relevant permits and approvals required by other state and federal agencies.

4. Sample Site Investigations - 1997

As part of this project and in conjunction with the Orphaned Land Program, 19 site investigations were conducted during 1996-97. An additional 10 sites were investigated but no evidence of mining activity was positively identified. The sites placed on the inventory can be generally grouped into the categories of manganese mines along the Blue Ridge mountains, or all mine sites in high priority watersheds in Warren and Essex counties. These sites covered 129 acres of land. Typical conditions encountered at these sites included unstable, eroding soils, steep rock high walls, trash dumps, open shafts, and portions of structures and equipment. A summary of the location information of the sites investigated is listed in Figure 1 below. The hazards found on these sites and the hazard scores assigned to them are included in Figure 2.

The total hazard rating for each site listed in these figures is the individual environmental and safety ratings for a site added together. This figure can be used as a general indicator of the magnitude of the problems at the site and the amount of cleanup that is necessary at the site. The more acres and mine features associated with the site the higher the total hazard rating is and the more cleanup that will be involved with the site. Examples of the two ends of the spectrum in the numbers for the total hazard rating are the Cold Spring Clay Pits and the Rexburg Sand Pit. The Cold Spring Clay Pits site had the highest score in the rating system with a total hazard rating of 600. This site contains many acres of severely denude lands that also pose safety hazards due to persons who try to climb its steep walls and spoil piles. The Rexburg Sand Pit on the other hand is about 1/20th the size of the Cold Spring Clay Pits and only has several hundred square feet of unvegetated area, thus its much lower overall score of 14.

Watershed Inventory

Several of the sites listed in the inventory were a part of an effort to conduct a comprehensive inventory in the state's high priority watersheds. Two high priority watersheds in Clarke and Warren county were selected for inventory. These watersheds were B41, Lower South Fork Shenandoah River, and B55, Upper Shenandoah River. Mining sites in these watersheds have been broken into the following three categories: Abandoned Sites - Located, Abandoned Sites - Unlocatable, and Active Permits. The investigations in these watersheds produced the following results:

Figure - B55, Upper Shenandoah River

Abandoned Sites Located

Seible Mine
Interstate Stone Corp. Quarry
Southern Railway Quarry

Abandoned Sites - Unlocatable

Interstate Stone Mine #3
McCarty Pit
Sealoch MIne

Active Permits

Rappawan Lumber
Riverton Corporation

Figure - B41, Lower South Fork Shenandoah River

Abandoned Sites Located

Calamus Creek Quarry
Gooney Manor Mine
Happy Creek Mine
Rudacill Prospect
Skyline Crushed Stone Co. Quarry
Virginia and Pittsburgh Copper Co. Prospects

Abandoned Sites - Unlocatable

Bailey Nickel Prospect
Poe Property Prospect

Active Permits

Figure 1. Identification Information for Site Investigations

Inventory#	Orphan Name	Latitude	Longitude	County	HU#	Mineral	Acre
96121	John's Run Prospect	37-45-00N	079-02-31W	Augusta	B31	Manganese	2
96122	Kennedy Mine	37-58-05N	079-00-30W	Augusta	B31	Manganese	5
96123	Mt. Torry Mine	37-56-40N	078-59-55W	Augusta	B31	Manganese	10
96124	Happy Creek Mine	38-54-47N	078-09-17W	Warren	B41	Iron	5
96125	Seible Mine	38-55-37N	078-08-28W	Warren	B55	Manganese	5
96126	Compton Mine	38-46-09N	078-21-29W	Page	B40	Manganese	5
96127	Red Mt. Mine	37-56-02N	079-05-18W	Augusta	I36	Manganese	12
96128	MN Hollow Workings	37-55-45N	079-05-40W	Augusta	I36	Manganese	5
97129	Wood's MN Mine	37-13-32N	079-16-24W	Campbell	L29	Manganese	5
97130	Henley Fork Gravel Pit	37-53-21N	076-53-39W	Essex	E23	Sand and Gravel	2
97131	Brays Gravel Pit	37-53-33N	076-52-53W	Essex	E23	Sand and Gravel	0
97132	Sturgeon Swamp Gravel Pits	37-53-12N	076-55-52W	Essex	E23	Sand and Gravel	0
97133	Longist Fork Gravel Pit	37-53-36N	076-54-33W	Essex	E23	Sand and Gravel	2
97134	Rexburg Sand and Gravel Pit	37-56-26N	076-59-10W	Essex	E23	Sand and Gravel	0.5
97135	Ridge Subdivision Sand Pit	37-55-56N	076-55-06W	Essex	E23	Sand and Gravel	0.5
97136	Cold Spring Clay Pits	37-57-37N	079-06-59W	Augusta	B30	Clay	70
97137	Southern Railway Quarry	38-55-33N	078-07-55W	Warren	B55	Stone	0.5
97138	Interstate Mine #3	38-56-55N	078-08-37W	Warren	B55	Stone	0
97139	Interstate Stone Corp. Quarry	38-56-50N	078-09-52W	Warren	B55	Stone	1
97140	Spencer Limestone Quarry	37-47-43N	079-24-28W	Rockbridge	I35	Stone	5
97141	Skyline Crushed Stone Co. Quarry	38-52-24N	078-15-05W	Warren	B41	Stone	2
97142	Gooney Manor Mine	38-52-59N	078-14-27W	Warren	B41	Copper	0.5
97143	Calamus Creek Quarry	38-57-13N	078-06-28W	Warren	B41	Stone	1
97144	Virginia and Pittsburgh Copper Co. Prospects	38-53-47N	078-12-28W	Warren	B41	Copper	0.5
97145	Gooney Creek Campground	38-52-05N	078-14-54W	Warren	B40	Stone	1
97146	Rudacill Prospect	38-50-55N	078-12-19W	Warren	B41	Copper	2

Figure 2. Site Investigation Hazard Summary

Inventory#	Orphan Name	Environmental	Safety Hazards	Environmental	Safety	Exposure	Total
96121	John's Run Prospect			4	0	8	4
96122	Kennedy Mine	ERO	LPIT	29.5	30	8	59.5
96123	Mt. Torry Mine	AMD,STN	SFT, LPIT, PPIT,WTR	14.75	162	7	176.75
96124	Happy Creek Mine	ERO	LPIT,SLPE	40	33	14	73
96125	Seible Mine		LPIT	2	35	12	37
96126	Compton Mine	ERO	TNL,EQP, IMP	16	29	7	45
96127	Red Mt. Mine		LPIT	12	68	7	80
96128	MN Hollow Workings	ERO,AMD		28	27	7	55
97129	Wood's MN Mine		SHFT	4	128	12	132
97130	Henley Fork Gravel Pit			7	7	18	14
97131	Brays Gravel Pit						
97132	Sturgeon Swamp Gravel Pits						
97133	Longist Fork Gravel Pit	UNV	LPIT,SLPE	9.6	12	5	21.6
97134	Rexburg Sand and Gravel Pit	ERO		14	0	11	14
97135	Ridge Subdivision Sand Pit	UNV		5	0	21	5
97136	Cold Spring Clay Pits	AMD, ERO, UNV	LPIT, HIGH,WTR, SLPE	524	76	12	600
97137	Southern Railway Quarry		SLPE	4	12	16	16
97138	Interstate Mine #3						
97139	Interstate Stone Corp. Quarry		LPIT,HIGH,WTR	7	15	7	32
97140	Spencer Limestone Quarry		LPIT,HIGH,WTR				
97141	Skyline Crushed Stone Co. Quarry	TRSH	LPIT,HIGH,WTR,STR	13	15	20	28
97142	Gooney Manor Mine		SHFT, STR	3	12	16	15
97143	Calamus Creek Quarry		HIGH	2	12	17	14
97144	Virginia and Pittsburgh Copper Co. Prospects		PPIT, HIGH	0	7	24	7
97145	Gooney Creek Campground		HIGH	1	14	23	15
97146	Rudacill Prospect		PPIT	0	0	0	0

Hazard Code Definitions:
AMD = Acid Mine Drainage
EQP = Equipment
ERO = Erosion
HIGH = Highwalls
IMP = Impoundment
LPIT = Large Pit or Quarry
PPIT = Prospect Pits
SHFT = Shaft
SLP = Unstable Slope
STR = Structure
TNL = Tunnel
TRSH = Trash
UNV = Unvegetated
WTR = Water-filled Pit

5. References

Epenshade, G. H., 1954, Geology and mineral deposits of the James River-Roanoke River manganese district, Virginia: U. S. Geol. Survey Bull. 1008, 115 p.

Gathright, T. M., II, Henika, W.S. and Sullivan, J. L. III, 1978, Geology of the Crimora quadrangle, Virginia: Virginia Division of Mineral Resources Publication 13, text and 1:24,000 scale map.

Jarrett, A.R. Water Management. Pennsylvania State University Engineering Copy Center. 1992.

Nelson, W. A. 1962, Geology and Mineral Resources of Albemarle County: Virginia Division of Mineral Resources Bulletin 77, 92 p.

Rader, E. K., and Webb, H. W., 1979, Geologic factors affecting land modification, Warren County, Virginia, Publication 15, text and 1:50,000 scale map.

Sweet, P. C. and Rowe, W. W. Jr., 1984, Selected Virginia mineral - resource information: Virginia Division of Mineral Resources Publication 51, 28 p.

Sweet, Palmer C., Richard S. Good, James A. Lovett, Elizabeth V. M. Campbell, Gerald P. Wilkes, and Lesley L. Meyers. Copper, Lead, and Zinc Resources in Virginia. Virginia Division of Mineral Resources. Publication 93. Charlottesville 1989.

U.S. Department of Interior, Bureau of Mines. 1995. Spatial data extracted from the Minerals Availability System / Mineral Industry Location System (MAS/MILS). Special Publication 12-95.

U.S. Department Interior, Bureau of Mines. 1993. Abandoned Mine Land Inventory and Hazard Evaluation (Draft).

U.S. Geological Survey. 1996. Mineral Resources Data System (MRDS). Digital Data Series DDS-20. Release 1.

Watson, T. L. 1907, Mineral Resources of Virginia: J. P. Bell and Company, Lynchburg, Va., 618 p.

Western Interstate Energy Board. Inactive and Abandoned Noncoal Mines. 1991.

6. APPENDIX A

VA Department of Mines, Minerals and Energy
Division of Mineral Mining

Orphaned Lands Inventory Report

A. SITE IDENTIFICATION B. SITE HISTORY C. SURROUNDING SITE
D. PHOTOS E. SITE MAP F. EXPOSURE
G. ENVIRONMENTAL H. SAFETY I. MONITORING
J. REFERENCES K. INTERVIEW

A. SITE IDENTIFICATION:

Date of Inspection: 7/17/2002 Inventory Author: ALLEN BISHOP

DMM Number: DMM03914 Acres: 100

MRDS Number: Author Affiliation: VA DMME - DMM

Site Name: MRV HUC: N08

Minerals: GRANITE Quadrangle: Austinville

County: Wythe Longitude: 80.9503 Latitude: 36.8441

OLAC Ranking:

Project Number: Environmental Score: 40

Brownfield Potential: No Safety Score: 150

OLAC Notes: Exposure Score: 39

Directions:

TAKE THE FORT CHISWELL EXIT OFF OF I-81. TAKE A RIGHT AND TRAVEL APPROX. 2 MILES, TAKE ANOTHER RIGHT ON TO IVANHOE/ROUTE 94 AND
TRAVEL APPROX. 10 MILES. TAKE A LEFT ONTO RIVERVIEW/ROUTE 39 TOWARD THE NEW RIVER TRAIL. KEEP GOING UP RIVERVIEW UNTIL END OF ROAD
ACROSS FROM ALMOND AND BLUE TRAILER.

Property Owner: MS. BARKER

Owner Address: Phone Number:

909 RIVERVIEW RD. 276-233-9132
IVANHOE, VA. 24350
276-699-9625

B. SITE HISTORY:

Mine Owner: NATIONAL CARBIDE

Date Last Mined: Date First Mined:

MineType: Quarry without water Shafts on Site:

Depth Below (feet): 150 Workings Length:

Pit Size:

100 ACRES

Notes on Site History:

USED FOR NATIONAL CARBIDE PLANT IN IVANHOE, HUGE QUARRY, NO WATER

C. SURROUNDING SITE:

Weather:

CLEAR, HOT, HUMID Air Temperature: 95

Foliage: SUMMER Precipitation: NONE

Topography: STEEP
PAGE 1 OF 3

D. PHOTOS:
1Number of Photos:10 Path to Photos: (\\WEBBSG\dmmolac\DMM03914\)

E. SITE MAP:

Sketch Map for site: No Sketch Map File Name:

F. EXPOSURE:

Site Visibility
Site Access: gravel road Visible from road: no

Site Access Notes:

TRAILER MOVED IN TO WITHIN 100 FEET OF STEEP WALLS
Site visibility from homes: visible
Estimate of Homes: 1 - 10 homes

Nearest Community: IVANHOE

Notes on Nearest Community and Nearby Homes:

Nearby Recreation Areas:1 mile, high useRecreation Area Name: NEW RIVER TRAIL

Site Usage: evidence of visitation, light
Notes on Site Usage:
SOME HUNTING, HARD TO GET TO

G. ENVIRONMENTAL:

Acid Drainage Notes:

Acres of Denuded Vegetation:

Rills on site: No Trash on site: Yes
Gullies on site: No Hazardous materials on site: No

Potential Ground
Water Contamination: Minimal

Potential Surface
Water Contamination: Minimal

Receiving Stream:

	Upstream	Downstream	At Mine Site
Conductivity			
Temperature			

Conductivity Units:

Environmental Notes:

Existing Wetlands on site: No

Potential for dredge material disposal if east of Fall Line:No

Potential Wetlands on site: No

Wetland Notes:

H. SAFETY:

Mine Site Hazards: Severe

No. of Vertical Caved Entrances:

Number of Vertical Open Entrances:

Toxic Chemicals and/or Explosives at site: No

Toxic Chemical / Explosives Notes:

Potable Water Supplies at risk: No

At Risk Potable Water Supply Notes:

No. of Horizontal Caved Entrances:

Number of Horizontal Open Entrances:

Horizontal Entrance Notes:

Existence of High Walls at the site: Yes

High Wall Notes:

Existence of Impoundments at site: No

Impoundment Notes:

Existence of Unstable Slopes at site: Yes

Unstable Slope Notes

Existence of Subsidence Areas: No

Subsidence Area Notes:

Number of Mine Dumps on site:

Mine Dump Notes:

Structure/Equipment Evaluation: None

Structure / Equipment Notes:

I. MONITORING:

Monitoring Results:

J. REFERENCES:

Reference Results:

K. INTERVIEWS:

Name of Person Interviewed: MS BARKER Date of Interview: 7/17/2002

Notes on Interview:
Nephews playing, realized that there was a lot of danger

1 RECORDS LISTED

7. APPENDIX B

Orphaned Lands Inventory Report

The following are a set of guidelines and sources of information for completing the investigation of each site.

A. Site Identification

DMM Inventory No. - Use the last two digits of the year of the investigation followed by the number in the orphaned land inventory for this site. Earlier site investigations included abbreviations for the county that the site was located in and the primary commodity from the site as portions of this code.

MRDS Record No. - This number can be obtained from the MRDS database on the DMME computer system. Other locations for this number include the hard copy of the MRDS database in the file drawer with the site inventory folders and in site description in DMR publications.

Site Name – Specify using the following format: MRV(quad#)_(site#) such as MRV206C_204. Quad numbers are per DMR designation as are site numbers on the quad. If a site is investigated that does not have a Site Number, the next available site number for that quadrangle is used.

Mineral(s) Mined - This information can be obtained from either MRDS or MILS, where it is available.

County - Both MRDS and MILS hard copies are sorted by county, thus this information can be identified by finding the entry for a particular site in these databases.

Quadrangle - Can be found in the MRDS database or by using the USGS topo map index which can be found in the library or at the publications sales desk to identify which particular map a site is located on.

Hydrologic Unit - Locate the site in the Virginia Hydrologic Unit Atlas and identify the hydrologic unit on which the site falls.

Latitude and Longitude - This information is collected in the field from a GPS unit, or other source, and entered as a decimal value (e.g., 38.90876).

Location - Enter the directions for someone to access the site here. Directions can be found in the on-line version of MRDS or can be created by viewing a topographic map of the site location.

Property Owner - Sometimes the owner is identified in the MRDS database. Otherwise, this information may come from local records on deeds and taxes.

Evaluation Scores (Environmental, Safety, and Exposure) - The values entered in these blanks are the totals for each category that are entered at the bottom of the page for each category.

B. Site History

Mine Operator - Primarily from MRDS database, but could also come from, interviews of locals, or county records.

Date Last Mined - From MRDS database, interviews of locals, or county records.

Mine Type - From MRDS database, interviews of locals, or county records.

Description of workings - From MRDS database, interviews of locals, or county records.

Narrative - From MRDS database, interviews of locals, or county records.

C. Surrounding Site

Weather – general observations

Surrounding topography - This entry can include descriptions of slope and physical features such as hills, mountains, ridges, and water features.

Archeological or historical sites - Determine from topo maps and site visitation. Prominent historical sites will likely be identified as recreational sites. Other sites may be judged based on their age and amount of preservation.

D. Photos

List the number of photos taken; this entry will provide spaces on the server for storing the photos. Photos are transferred from the camera to the server computer as digital images. The transfer is made after a record has been created on the server for a particular site. The link between a set of photos and a particular inventory record is the DMM# assigned to the site.

E. Site Map

If a sketch of the site is made, it should be in digital format using the “Draw” tools on a computer application program such as MS Word. The resulting sketch is transferred to the database in the same manner as a photo.

E. Exposure

Access - Determine closest access from topo maps. Identify the site and the area within 1/2 mile

of the site, then determine the level of road that falls within this area. Any new roads or road upgrades should be identified on the site visit.

Number of homes - The number of homes in the area identified in the previous step should be counted up and entered here. Verification of this number should be made on the site visit.

Proximity to recreation areas - Use a topo map in a manner similar to the previous two entries, but using different distances. Recreational area usage can be approximated by the number of people that the site is intended to be used by at one time, as indicated by the parking provided at the area. Low use areas would have parking for less than 10 vehicles, Medium use areas 10-30 vehicles, and high use areas more than 30 vehicles.

Site Usage and History - Assign a score to this entry based on the descriptions given in the entry.

This description could be determined from the number of contour lines across a given distance on a topo map, descriptions of the soil families in the soil survey, or site visitation. Values from this description should not necessarily be used for determinations of erosion, because spoil piles, tailings piles, and site excavations, where erosion is occurring may have different slopes than the surrounding land.

Land use of surrounding area - An initial assessment of land use can be made from topo maps and the soil survey. Land use can be grouped into the following categories:

Agricultural
Forest
Developed (Housing/Small business)
Industrial
Grassland
Wetlands

G. Environmental

Note: The entries for acres for each problem in this section are made using investigator judgment, therefore are meant to be approximations.
Note: Environmental problems are rated by assigning 10 points for each acre of the site affected by severe problems, and fewer points for each acre of less severe problems.

Erosion - approximate measure of acreage eroded on site

Acidic Drainage - Surface waters lying on and flowing through and from mine soils should be tested for pH and the lowest value recorded in this entry along with an estimate of the acreage affected.

Flow rate (GPM) - The following procedure from the U.S. Department of the Interior, Bureau of Mines, Abandoned Mine Land Inventory and Hazard Evaluation Handbook will be used where seeps are of significant quantity:

"To determine water flow rate, find a relatively straight section in the water channel, preferable 0.9 m (3 ft) long, and determine the average width and depth. Use a small piece of twig or similar item to determine the flow rate (time to travel 3 ft., for example and determine the time (in seconds) for the object (twig) to travel the given distance (e.g. 3 ft). Calculate gallons per minute as follows:

$$\frac{60 \text{ sec/min} \times \text{length (in inches)} \times \text{average width (in inches)} \times \text{average depth (in inches)}}{(231 \text{ in}^3/\text{gal}) \times \text{time (in sec)}}$$

or

$$(0.26) \times \frac{\text{length} \times \text{width} \times \text{depth}}{\text{time}} = \text{gpm}$$

where: Length, width, depth in inches; time in seconds."

pH - The pH of any water found on site will be taken using a calibrated pH indicator.
conductance - The conductivity of any water found on site will be taken using a calibrated conductivty indicator.
temperature - The temperature of any water found on site will be taken using a calibrated thermometer.

Acidic Soil Conditions - Soils in and around the site should be tested for pH. Areas directly affected by mining such as spoil piles and tailings ponds need tested along with undisturbed areas which may be affected during runoff events. Enter the lowest pH tested.

Lack of Vegetation - Include areas which have less than 50 percent of the vegetation of surrounding area in this acreage.

Trash dump - Include areas in or adjacent to mined areas which have household trash (automotive, furniture, cans, etc.). Some dumps may have industrial waste, but this waste, which may include machinery or chemicals, will generally fall into the next category)

Hazardous/Toxic Materials -

Heavy metals - assign points in this category based on the presence of acid mine drainage and mined materials which are susceptible to heavy metal drop out.
Known carcinogens - These hazards are indicated by the item in the dump (ie old transformers are sources of PCB's) or containers found at the location (pesticides).

Groundwater Contamination

Shafts present - Shafts may be a direct route for pollution on the land surface to reach groundwater or speed up the rate at which subsurface pollution reaches lower level groundwater.
Water-filled pits - The presence of water in a pit indicates that the mine is below the water table and groundwater is affected by the same problems as found on the surface.
On-site pollutant identified in adjacent well - Pollution from a mine site has already reached and spoiled a drinking water or agricultural water source if this condition exists.

Surface Water Contamination:

Receiving Stream - Enter the surface water bodies that water from the mine site flows into up to a hydrologic unit for DSWC. Small streams may be identified from topo maps.
pH - Enter the pH of the water as it first enters the receiving stream from the mine site.
Impact - Estimate the distance downstream from the mine site which: remains acidic or shows sign of reduced aquatic fish and plant populations.

Visual Compatibility - Rate the site on whether its vegetation and topography resembles adjacent unmined areas. If the mine area can be seen from a paved state road, the visual compatibility points are doubled.

Environmental Score - Sum up values for each entry on this and the previous page.

Wetlands - Look for general indicators of wetlands, such as wet, marshy conditions even after a dry spell, vegetation such as cat tails, black, rich soils that are indicative of water logged conditions. For the second blank, whether there is enough area and possible conditions for constructing wetlands for a Department of Transportation wetlands banking program. Sites that would be good for wetlands banking would be in soils that are already supporting vegetation.

H. Public Health and Safety Hazards

Vertical (shaft) Openings - Enter the number of suspected shafts and then characterized them as wet, dry, caved, or accessible.

Toxic chemicals and explosives - Note if any chemical drums or explosive equipment is on site.

Drinking water source threatened - Indications of a threat to the drinking water would be toxic or hazardous chemicals at the mine site and an indication that these chemicals could be transported to a drinking water source, such as groundwater lying in a pit or a shaft through which water could travel.

Horizontal (tunnel/adit) openings - Enter the number of suspected adits and then characterize these openings as caved or accessible.

Highwalls - Highwalls are edges of mining operations that rise vertically from the land surface 20 feet or more.

Dangerous impoundment - Impoundments are "walls," usually composed of soil and rock, which are storing water. Impoundments are considered dangerous if the water level is near the top of the structure and threatening to overtop it, or there are signs that the impoundment may give way, such as movement in the impoundment wall are water seeping through the wall.

Dangerous slide area / unstable slopes - These areas may be indicated by the presence of some soil movement already, steep slopes, and the lack of soil at their base.

Subsidence - Subsidence is indicated by depressions in the soil surface above mine tunnels.

Mine dumps - Areas of land with piles of material removed from the mine. These piles may be much higher than the surrounding landscape and have steep slopes which may be dangerous.

Pits in mine area - Pits are the portions of mine areas that were excavated into the ground. Often, pits have filled with water and/or been used as a trash dump.

Equipment and structures - Equipment or facilities to remove and excavate material may still exist on the site. This entry should be rated according to the descriptions that accompany each point value.

Safety Score - Sum up values for each entry on this page.

I. Monitoring

Use this section to record monitoring completed in addition to the monitoring recorded above.

J. References

Sources of information for completing the site investigation, either written or from an interview

should be identified here.

K. Interviews

Use this section to detail any interviews conducted pertinent to the site investigation.