

EPCAMR Mine Map Grant Project

The PA Department of Environmental Protection (DEP) recently awarded EPCAMR a 3-year grant agreement, from the newly established Mine Map Grant (MMG), which will provide funding for projects that are proposed by applicants to process mine maps and other mine related information into electronic formats. The projects may propose to process information that is owned or under the control of the PA DEP, the applicants or both. As a result of the work completed under the MMG, processed mining information will be available for use in computer systems that allow the information to be provided to the public in a fraction of the time it takes to provide them with unprocessed information. The processed information will be used by property owners and developers, by the grantees for their own purposes and by PA DEP to further enhance the systems that deliver mining information to the public and contribute to safe and economic mining practices. In addition, the information in electronic form establishes permanent records that will not deteriorate over time, that can be further processed and that can be stored without the need for costly filing and warehousing.

Purpose of the MMG

Mining information is needed by the residents and developers of the mining regions of Pennsylvania to make informed decisions whenever a house or building is built or purchased, when roads, schools or other public facilities are constructed or when mining and reclamation operations are conducted. The information is vital to economic activity and to the safety of the residents of the mining regions and those working in or visiting those regions. Processing the mining information into electronic forms allows it to be used in computer applications, which then allows it to be retrieved, managed and manipulated in a fraction of the time it takes to do so from perishable, printed maps and data sources.

The MMG provides funding, on a competitive basis, to preserve, improve, convert and further process into electronic form maps, data, and images of mines that are located in Pennsylvania. In addition to the processing of mining information held by DEP, the MMG is intended to identify private collections of mine maps and data that potential grantees are able to process into electronic form and then release into the public domain.

Once the grantees process the mining information into electronic form it may be permanently stored, further processed, retained and used by the grantees for their own purposes. Grantees will also provide copies of the electronic files to the DEP. The electronic information will be permanently stored by DEP in secure and redundant locations and used in computer applications it manages so that the information is readily available to the residents of the mining regions, businesses and to government programs that provide and interpret the information to the public and to the mining industry.

Please read the following link on a recent article in the Scranton Times newspaper on 9-29-2013.

<http://thetimes-tribune.com/news/into-the-void-mapping-abandoned-mines-in-3d-1.1560241>

Job Description and Responsibilities: **EPCAMR Geographic Information Systems Specialist**

(Part Time)-Up to 29.5 hrs/week maximum

- A bachelor's degree in geology, geography, environmental science, geographic information systems (GIS), environmental engineering, planning, political science, with a specialization in computer science is the minimum education requirement with 2 years of project experience in GIS applications
- Will be responsible for developing and maintaining geographic, political, mining, geological, tax parcel, and environmental databases that are pertinent to the Anthracite Region under the Mine Map Grant project
- Will design and update GIS databases using various mathematics techniques, such as coordinate geometry, conversion of vectors and real analysis
- A proficient knowledge of computer software programs used in cartography is integral to job function
- An ability to interpret aerial photographs, mine maps, underground mine maps, and historic mine maps, then transfer and/or rescale them to geographic maps, in addition to performing geospatial modeling, analysis and data manipulation will be required
- Ability to operate a Dell Precision Laptop work station running on Windows 7 OS, connected to a Colortrac SmartLF GX+ T42c and T56c wide format color map scanner
- Skilled in versions ArcGIS 9.x to 10.x
- Will receive in-house training on how to use the color map scanners for scanning and cataloguing of mine maps and or an Altek Datatab Pro Line AC31 Digitizer for maps that can't be sent through a roll-style scanner
- Will need to become very familiar with the SmartWorks Pro software for post-processing of mine maps
- Need to be organized, detail-oriented, a critical thinker, a problem solver, and have administrative skills
- Need to show self-initiative, self-motivation, is focused, and works independently
- Ability to input mine map attribute data into the PA Historic Mine Map Inventory System (PHUMMIS) database, which is a Microsoft Access database
- Ability to collect metadata, to be determined by the PA DEP Project Manager and meeting all Federal and State requirements for geospatial data shall be created for all Archive Mine Map Images, and entered into a database in the most recent version of ESRI's ArcGIS software for all appropriate geospatial data
- Will receive in-house training on Anthracite Region Mine Map Interpretation to understand how to read mine maps and how to interpret mine map symbols, notations, notes, hydrogeological and mining geological terminology from the EPCAMR Staff
- Will be supervised by the EPCAMR Executive Director and Program Manager-will report to Program Manager who will be overseeing the work of the GIS Technician
- Will have familiarity and experience with utilizing earthVision 2D & 3D Modeling and Visualization Software utilized by the EPCAMR Staff
- Will already have the ability to take a post-processed Mine Map Image that needs to be geo-referenced so it can be used in a geographic information system (GIS); The most recent version of ESRI's ArcGIS software should be used to complete this task
- Will use the most accurate basemaps currently available to EPCAMR to geo-reference
- PA MAP High Resolution Orthoimagery will be the optimal base layer, however, other basemaps and orthoimagery may also be used with the PA DEP Project Manager's approval
- Geo-reference (also knowing as geo-register) 1000 maps from PA DEP's Pottsville Deep Mine Safety (POTT_00001-01000)
- Geo-reference 1000 maps from PA DEP Wilkes-Barre's Bureau of Abandoned Mine Reclamation's (BAMR) District Mining Office (DMO) (WILK_00001-01000)

- Geo-reference 500 maps from EPCAMR's Blue Coal Collection (BLUC_00001-00500)
- Digitize 300 maps from PA DEP's Pottsville Deep Mine Safety (POTT_00001-00300)
- Digitize 500 maps from the PA DEP's BAMR DMO (WILK_00001-00500)
- Digitize 200 maps from the PA DEP's Blue Coal Collection (BLUC_00001-00200)
- Will re-do any work not meeting the PA DEP's standards and or specifications as requested by the PA DEP under the grant agreement for the Mine Map Grant
- Will have the responsibility of safely transporting, returning, maintaining, storing, and handling of all mine maps, field equipment, and computer equipment included for the Mine Map Grant
- Will submit a monthly work progress report and Inventory Control Sheet in a format created and utilized for the Mine Map Grant by the PA DEP provided to the EPCAMR Program Manager
- Must follow the Mine Map Processing Standards outlined in **Attachment E.1** of the Mine Map Grant (will be provided to the EPCAMR GIS Specialist) unless otherwise authorized by the PA DEP Mine Map Grant Project Manager; Should a higher parameter be required to capture all of the information on the map, it is recommended that the higher parameter be used. These standards will be used to create the Archive Mine Map Image; The level of difficulty for the Scanning portion of the project is complex; #3, #4, & #5 of Attachment E.1 must be strictly adhered to during the Mine Map Grant project, and any deviations from these Standards will be communicated by the EPCAMR Executive Director or Program Manager as allowed by the PA DEP Project Manager
- Field work investigations may be necessary from time to time to GPS cornerstones, survey points, field stones, building foundations or footprints, mining structures, and or abandoned mine land features throughout the region; Familiarity with handheld, GPS units is necessary; However, majority of time will be spent on scanning and cataloguing in the EPCAMR Office
- Field work could involve photography and taking pictures to develop photo-essays of the site locations being ground-truthed for the PA DEP
- EPCAMR will not set your work schedule due to the part-time nature of the position, however, it is in your best interest to spend large chunks of time daily on the project to reduce your need to travel to and from the EPCAMR Office (mileage cannot be reimbursed to and from work)
- Mileage will be reimbursed at the State rate, should you need to travel from the EPCAMR Office location to the field, Wilkes-Barre PA DEP BAMR DMO, Pottsville Deep Mine Safety Office, Harrisburg Office, or other off-site locations as directed by the EPCAMR Executive Director and or Program Manager

Tools & Technology

Tools used in this occupation:

Facsimile machines — Fax machines, Photocopiers — Photocopying equipment

Global positioning system receivers — Global positioning system GPS devices

Plotter printers — Large-format plotters; Plotters

Scanners — Computer data input scanners; Digitizers

Technology used in this occupation:

Analytical or scientific software — Coordinate geometry COGO software; ESRI ArcGIS Geostatistical Analyst; ESRI ArcGIS Spatial Analyst; Landmark Graphics GeoGraphix software

Data base user interface and query software — Autodesk Topobase; ESRI ArcEditor; Microsoft Access; Structured query language SQL

Map creation software — ESRI ArcGIS software; ESRI ArcIMS; ESRI ArcView; Trimble Pathfinder Office

Knowledge

Computers and Electronics — Knowledge of electronic equipment, and computer hardware and software, including applications and programming

Geography — Knowledge of principles and methods for describing the features of land, rivers, streams, coal, mines, abandoned mines, including their physical characteristics, locations, interrelationships, and distribution of them

English Language — Knowledge of the structure and content of the English language including the meaning and spelling of words, rules of composition, and grammar

Mathematics — Knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications

Design — Knowledge of design techniques, tools, and principles involved in production of precision technical plans, blueprints, maps, drawings, and models

Engineering and Technology — Knowledge of the practical application of engineering science and technology. This includes applying principles, techniques, procedures, and equipment to the design and production of various goods and services

Customer and Personal Service — Knowledge of principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction

Skills

Critical Thinking — Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems

Reading Comprehension — Understanding written sentences and paragraphs in work related documents

Complex Problem Solving — Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions

Speaking — Talking to others to convey information effectively

Active Learning — Understanding the implications of new information for both current and future problem-solving and decision-making

Judgment and Decision Making — Considering the relative costs and benefits of potential actions to choose the most appropriate one

Active Listening — Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times

Mathematics — Using mathematics to solve problems

Writing — Communicating effectively in writing as appropriate for the needs of the audience

Coordination — Adjusting actions in relation to others' actions

Abilities

Inductive Reasoning — The ability to combine pieces of information to form general rules or conclusions (includes finding a relationship among seemingly unrelated events)

Near Vision — The ability to see details at close range (within a few feet of the observer)

Deductive Reasoning — The ability to apply general rules to specific problems to produce answers that make sense

Written Comprehension — The ability to read and understand information and ideas presented in writing

Flexibility of Closure — The ability to identify or detect a known pattern (a figure, object, word, or sound) that is hidden in other distracting material

Information Ordering — The ability to arrange things or actions in a certain order or pattern according to a specific rule or set of rules (e.g., patterns of numbers, letters, words, pictures, mathematical operations)

Oral Expression — The ability to communicate information and ideas in speaking so others will understand

Problem Sensitivity — The ability to tell when something is wrong or is likely to go wrong; It does not involve solving the problem, only recognizing there is a problem

Visualization — The ability to imagine how something will look after it is moved around or when its parts are moved or rearranged

Category Flexibility — The ability to generate or use different sets of rules for combining or grouping things in different ways

Work Activities

Interacting With Computers — Using computers and computer systems (including hardware and software) to program, write software, set up functions, enter data, or process information

Analyzing Data or Information — Identifying the underlying principles, reasons, or facts of information by breaking down information or data into separate parts

Processing Information — Compiling, coding, categorizing, calculating, tabulating, auditing, or verifying information or data

Getting Information — Observing, receiving, and otherwise obtaining information from all relevant sources

Updating and Using Relevant Knowledge — Keeping up-to-date technically and applying new knowledge to your job

Communicating with Supervisors, Peers, or Subordinates — Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person

Thinking Creatively — Developing, designing, or creating new applications, ideas, relationships, systems, or products, including artistic contributions

Interpreting the Meaning of Information for Others — Translating or explaining what information means and how it can be used

Making Decisions and Solving Problems — Analyzing information and evaluating results to choose the best solution and solve problems

Identifying Objects, Actions, and Events — Identifying information by categorizing, estimating, recognizing differences or similarities, and detecting changes in circumstances or events