

MRL Strategy -2006

History

The Laboratory was established in 1946 for the purpose of evaluating potential ore deposits deemed practical by the State Geologists. This arrangement lead to the enhancement of the feldspar, mica, lithium, silica sand, high purity quartz, phosphate, and olivine mining industries in the state. Today these mining operations generate one billion dollars a year of revenue while tying up 0.37 % of the available land in the state. The mining industry brought other manufacturing operations to the state, including brick, glass, chemical, plastic forming, ceramic white ware, construction and maintenance companies, parts and steel suppliers, and etc. What was true a half of a century ago is still true today: utilization of our mineral wealth will generate economic prosperity.

Current Environment

The State employs twenty three geologists, none of which are directed full time to identify potential economic mineral deposits for mining. In fact, in the late 90's the State was considering shutting down the State Geologic Survey. As a result (along with the growing reputation of the MRL in their industrial minerals expertise), for the past couple of decades the focus of the Lab has drifted into doing mineral work outside the state and, more divergently, non-mineral based work to provide support for the industrial sector. This deviation from the original mission of the Lab has quite possibly reduced industry revenue tens of millions of dollars per year by not capitalizing on the State's abundance of natural resources. In addition, the mining industry in the state and nationally has done little to encourage young professionals to be trained in the mining disciplines, thus loosing a generation of professionally trained employees.

Current Course of the Lab

To counteract the recent trend, a three-legged approach is recommended: 1) education; 2) in-state geologic and processing work

on new deposits, byproducts and/or waste streams; 3) continued in and out of state sponsored programs.

Personnel: The Lab is undergoing a change in work emphasis and the type of positions needed. First, the three above categories will have three engineering professionals championing each area. Dr. Robert Mensah-Biney will be responsible for the academic pursuits of the Lab. He will develop a separation technology course for UNCA for their earth science and environmental programs. This is the beginning of an effort to get local young professionals interested in the work of MRL and at the same time teach engineering aspects in the earth science field. In the recent past, students from these programs have done senior projects at the lab and have held part time jobs at MRL. This informal arrangement proved the interest. A more formal arrangement will be established between UNCA and MRL through this academic class. It is our intent, if received well by the UNCA faculty and students, to expand the course selection in this area. In addition, progress is being made with the Geology section at NC State to utilize the Lab for a graduate course on economic geology through Dr. Jeff Reid. This, if brought to fruition, will further the capability of training more professionals to be utilized in the State's mining industry or future employees of MRL. (funding: ledger#2 state account)

The second category, in-state mineral reserves that are not currently defined in terms of economic potential or required processing, will be headed by Robert Carland. This effort is aimed at convincing the State Geologic Survey to designate one geologist, hopefully Dr. Jeff Reid, to work with MRL on a more formal basis to define and process potential ore deposits in the State. The work will involve field geology, microscopy, topographic and geologic mapping, and bench scale processing. UNCA SEM and XRD units will be available through Dr. William Miller to assist MRL in the processing. In addition, R. Carland with Dr. Mensah-Biney will continue to assist in-state mining companies with byproduct and waste process streams. (funding: ledger #2 state account)

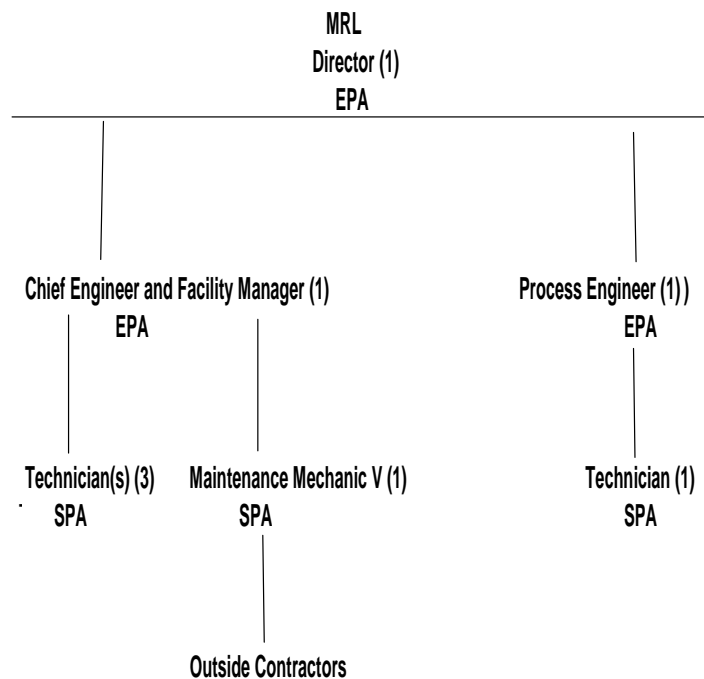
The last leg of the strategy, commercial sponsors and pilot plant activity, will be the responsibility of the Chief Engineer John Schlanz. John will run three technicians along with a facility maintenance man to achieve improved co-ordination within the facility by scheduling and

maintaining most of the equipment through one engineer. This will enable improvements to the existing facility and process equipment. (sponsored work: #3 Trust Fund Account)

The organizational chart is as follows:

April, 2006

NORTH CAROLINA STATE UNIVERSITY
INDUSTRIAL EXTENSION SERVICE
MINERALS RESEARCH LABORATORY
ORGANIZATIONAL CHART



The emphasis is not on grant writing but if a solid opportunity arises the staff will pursue the funding. The fact that N C State does not have a strong minerals program and does not have alumni to support such efforts has lead to poor success in the numerous energy related grants that have been applied for in the past. Certain Universities have a

strong history and powerful alumni that enables a higher degree of success in attaining grants. The old adage of “who you know” applies.

It is believed with the eight people listed above that the lab will have an active schedule and will be able to maintain and grow the majority of it’s business through the state funds, leaving the industry sponsored income for the improvement of the laboratory.

Marketing: This area will be addressed by three activities: website improvement; membership in Industrial Mineral Association of North America; and performing solid work for sponsors (word-of-mouth). The internal capability of IES will be utilized for the improvement of the existing website. The graphics need modernizing along with an active news section to give the industry and the world recent updates on state projects and minutes of the in-state advisory council. The second effort, membership in IMA-NA, will give the MRL access to top decision makers in the largest industrial mineral operations. The association meets twice a year and is a valuable resource for future sponsored work and industry knowledge. The third and last avenue is a result of a fairly tight-nit industry and it is “word-of-mouth”. This is by far the most important aspect of improving the Laboratory. The near term plan is to add one technician along with a dedicated maintenance man for the facility. This will enable the Lab to turn around the work quicker to the industry. Coupled with spending excess money on equipment rather than salaries will enable the lab to not only increase the volume of work, but improve the quality due to more competent equipment. Once we improve the above, the need for additional professionals will be re-assessed.

Equipment Purchases: The needs can be broken down in three main categories: analytical; process; and maintenance. The excess money in the trust fund will be spread across these categories as project needs and industry trends dictate, avoiding the purchase of equipment that remains idol. In 2006 a microscope to generate report pictures was purchased along with an XRF press to enable the one year old XRF unit to be used. As far as process equipment, pumps, screw classifiers, hydrosizer controls and a product conveyor will be purchased. Finally, the maintenance shop is being moved to a larger room and new equipment for simple fabrication and repair will be determined by the

new maintenance person along with the Chief Engineer. In future years more of all will be purchased to further enhance the facility.

Facility Repair and Improvement: Mineral and chemical wastes were removed during the winter of 2006. Once the maintenance position is filled any obsolete equipment will be cut up and scraped leaving more building space to better organize the remaining equipment. The facility roves will be inspected and defined for the University to repair with their Raleigh staff and building funds. The offices and labs will be painted and, where needed, new furniture and flooring installed. This process will take three years to dramatically upgrade the Lab's building appearance.

Financial Goals: To achieve the equipment modernization goal, sponsored work will have to generate the following revenue targets based upon fiscal year:

<u>Year</u>	<u>Individual</u>	<u>Cumulative</u>
2006	\$100K	\$100K
2007	\$150K	\$250K
2008	\$160K	\$410K
2009	\$190K	\$600K
2010	\$200K	\$800K

This profit generation will enable the purchasing of all needed analytical and process equipment to further bolster the reputation of the Lab in the industrial mineral industry.

Strategy Review: The strategic plan will be reviewed and re-published on a three year cycle. The next review will be in 2009.