

**OHIO COAL DEVELOPMENT OFFICE OF THE  
OHIO AIR QUALITY DEVELOPMENT AUTHORITY**

**OHIO COAL RESEARCH CONSORTIUM (OCRC)  
2011 PROPOSALS SOLICITATION**

**Research Grant Process Schedule**

- 1. Monday May 23, 2011 – Proposals due by 5:00 PM**
- 2. Near June 15-16, 2011 – Consortium Review Committee (CRC) meeting to discuss and select proposals for funding**
- 3. Near Monday June 20, 2011 – Email selection notice to researchers**
- 4. July 21, 2011 – OCDO Technical Advisory Committee (TAC) meeting**
- 5. August 9, 2011 – Ohio Air Quality Development Authority (OAQDA) meeting**
- 6. August 23, 2011, – Prime grant between OCDO and the consortium administrator signed**
- 7. September 1, 2011 – Subcontracts between consortium administrator and the universities of the consortium signed**

**INTRODUCTION** – The Ohio Coal Development Office (OCDO), a program of the Ohio Air Quality Development Authority (OAQDA), invites interested and qualified Ohio universities to submit proposals for the Ohio Coal Research Consortium 2011 (OCRC 2011) that meet the Technical Goals and Objectives presented below. The projects will be for two years including the academic years 2011-2012 and 2012-2013. The Consortium title OCRC 2011 identifies the year that funding was awarded.

**OHIO COAL RESEARCH CONSORTIUM (OCRC) BACKGROUND** – The State of Ohio has long encouraged the economic and clean use of its vast reserves of coal and the jobs associated with its production and use. This support mainly is derived from OCDO. While primarily focused on larger-scale demonstration and deployment of near-to-term technologies, OCDO also supports university research directed to improve the science and technology of chemical and physical processes involved in coal use. The involvement of Ohio universities serves a four-fold purpose: 1) to address technical problems being experienced today by Ohio coal and end-users and improve technologies that enable continued or expanded use of Ohio coal; 2) to improve the environmental performance of coal-based technologies; 3) to generate innovative research in the field of coal use; and 4) to train a future supply of Ohio-based scientists and technologists in clean coal and emission control technologies.

The Ohio Coal Research Consortium (OCRC) was created in 1990. The initial Consortium involved four Ohio universities and was a five-year effort. The Goal was to develop a base of fundamental knowledge to complement practical field experience from demonstration projects presently underway. Sulfur control encompassed essentially all of Consortium-1 focus. Following the technical and academic success of Consortium-1, OCDO continued funding Consortia for a total span of 20 years. Topics of the Consortia have evolved to include NOx control, toxic elements control, mercury control, CO<sub>2</sub> control, and more recently to hydrogen from coal, direct coal fuel cells, fuel cells for coal syngas, and production of chemicals from coal. In planning for Consortium AY07-08 it was noted that research priorities change much faster than could be accommodated in four and five year programs. Hence starting in 2007, topics for research are amended on an annual basis and projects are funded for two years of work.

### **CONSORTIUM STRUCTURE**

**1) Ohio Coal Development Office** – OCDO provides guidance, direction and funding to the OCRC and sets areas of research. It receives and reviews the quarterly and final project reports, arranges on-site tours, and status and other meetings for the Consortium. OCDO arranges the annual meeting of the Consortium Review Committee (CRC) to evaluate the previous year's work and the next year's project proposals.

**2) Consortium Administrator** – The Ohio Coal Research Consortium is funded and overseen by the OCDO, with one member university acting as the Consortium Administrator (CA). The CA contracts with OCDO for the "prime" grant agreement and then subcontracts with each of the other universities involved in the Consortium; receives and reviews invoices from all Consortium members and sends them as a package to OCDO. Funds for payment of the invoices are transferred from OCDO to the CA, who then pays the subcontractors' invoices. The CA also assists the OCDO in planning of review meetings, site visits and other Consortium meetings.

**3) Consortium Review Committee (CRC)** – The CRC is a group of individuals drawn from various fields of coal expertise. Among these are: electric utilities, coal producers, federal and state government, private research entities, private coal consultants and scientists. Each project is assigned two or three members from the CRC to act as members to the project, review it throughout the year and offer observations and advice.

The CRC and OCDO staff will conduct reviews of full proposals at **the June 15- 16, 2011 CRC meetings**. Proposals for projects new to the Ohio Coal Research Consortium as well as proposals on projects, which are a continuation from Consortium AY 09-10 are **due to OCDO no**

**later than 5:00 P.M on May 23, 2011.** No amendments to the proposals will be accepted after the deadline.

**4) The CRC June meeting** –The CRC and OCDO staff will evaluate and recommend projects on a merit and priority basis. After the June CRC meeting, the CRC Chair prepares a report for the TAC recording the CRC’s review and recommendations on each project proposal.

**5) The OCDO Technical Advisory Committee (TAC) & The Ohio Air Quality Development Authority (OAQDA)** - In accordance with OCDO’s statute, every project proposed for funding must first be reviewed in a public meeting by OCDO’s TAC. OCDO staff will present the recommendations of the CRC to the TAC. The TAC must vote whether or not to recommend funding of a program or project to OCDO, which in turn recommends funding to the Ohio Air Quality Development Authority (Authority), which has final approval. Once the approval of the Authority is received, OCDO enters into grant negotiations with the CA. These are usually completed in August; therefore, it is incumbent upon the CA to negotiate concurrently the subcontracts with the other OCRC members along with the prime grant in order to meet the start of the new school year (September 2011).

In any event, OCDO/OAQDA reserves the right to accept or reject in whole or in part any or all proposals if it is determined to be in the best interests of the State of Ohio to do so.

**PROJECT QUALITY SAFE GUARDS IN A TWO-YEAR FUNDING CYCLE** – Though it is the intention of OCDO that every project which receives a two year grant would complete two full years of productive work, there will be one condition for continuation of a project from year one to year two. During the first year of the project, OCDO staff will conduct either a site visit or conference call concerning the project in May of 2012 and again in July of 2012 to confirm that the project statement of work and the Gantt chart have been followed. It is anticipated that the great majority of projects will satisfy this condition. For projects that have satisfied this requirement, OCDO staff will email the CA and PI by August 31, 2012 a confirmation that the project has followed the statement of work and the Gantt chart and that the grant is to remain open as anticipated. If OCDO finds significant problems regarding these criteria, OCDO and the project mentors will discuss the situation with the PI by August 1, 2012 to attempt a resolution. If a resolution of concerns is not possible by August 31, 2012, the project funding will be discontinued on August 31 2012. Again, it is anticipated that a decision to discontinue the project after year one will be a rare event.

There will be events where experimental results make it appropriate to consider changes to the statement of work and the Gantt chart. In such cases, OCDO staff and the project mentors will

work with the PI to adjust the program. Such adjustments of direction, when done in consultation with OCDO staff and the project mentors, will not jeopardize continuation of a project for the full two years of the grant.

**RESTRICTIONS ON NUMBERS OF PROPOSALS A PI MAY SUBMIT** It is the goal of the RFP that PIs only submit their best concepts for consideration. The submittal of numerous proposals by one PI is not acceptable and therefore, the following restrictions will be placed on the number of proposals a PI can submit.

1) A PI must be a Professor, Associate Professor, or an Assistant Professor. Post Doctoral students and administrators of laboratories can serve as Co-PIs but they cannot submit pre-proposals nor serve as PIs on a project.

2) A PI of a project of Consortium AY09-10 may submit proposals for continuation of all his/her current projects.

3) In addition to submittal of proposals for continuation of projects of Consortium AY09-10, any PI may submit one proposal for a new project.

**Leveraging of OCDO Funds** – Proposers should attempt to use grants from OCDO in leveraging co-funding from other sources such as federal funds or other state or private funds for the project. An executive summary of any companion proposal(s) submitted to US DOE, other federal, state or private entity or funding program should be attached as an appendix to the proposal. The anticipated decision date and funding time frame of companion proposals should be included. Full-proposals that contain a companion proposal executive summary will be evaluated much more favorably than those that have not attempted the same. (Note: If a proposal was submitted and the final decision was unfavorable, the attempt to leverage will be recognized regardless of the outcome.)

**OCRC 2011 TECHNICAL GOALS & OBJECTIVES** – The technical goals and objectives of OCRC 2011 are set forth below. Proposers are advised to keep current with the latest air emissions restrictions enacted or proposed by the US Environmental Protection Agency so that proposers' research and work will remain relevant to the ultimate end user. Proposers should exhibit an awareness of the anticipated environmental restrictions end users will have to meet and the cost of meeting environmental restrictions.

If the project addresses emission control for a PC power plan or an IGCC power plant, the proposer must clearly demonstrate that the technology being studied can be practically applied

and must supply some rudimentary estimates as to the economic cost and viability of the concept or process. These proposals must identify application details for the process being investigated with respect to a common, large scale (500+ MW), coal-fired power plant. **Attachment 1** contains typical operating ranges for a large-scale PC fired power plant. Specifically, for the process being investigated, describe the anticipated location in the gas train and the appropriate range of temperatures, gas composition, residence times, pressure drop, etc. Proposals should contain citations and specific information from accepted industry standards, such as those found in Babcock & Wilcox's **STEAM**, to corroborate the proposal's assumed operating conditions of the proposed process or concept. It is acceptable for the technology to be aimed at a smaller scale plant as long as the proposal cites typical operating conditions found in such units.

In the area of air toxics, mercury is the air toxic of primary concern. However, for PC fired boilers in Ohio, which in most cases will soon be equipped with SCR for NO<sub>x</sub> control and FDG scrubbers, mercury control is not as pressing an issue today. Therefore, new projects for mercury control in PC fired boilers will only be considered if the concept has the potential to dramatically reduce the cost of mercury capture to the range of \$1000 per pound. Control of mercury emissions in IGCC plants or coal gasification systems at high temperatures is still a priority topic.

With international concern regarding the issue of global warming, carbon management – also referred to as the management of CO<sub>2</sub> and methane emissions – is receiving considerable attention from research groups worldwide. Clearly, coal is at the center of this discussion and it is consequently of special concern to OCDO. Carbon management poses special challenges to the power production industry. In line with these concerns and this challenge, OCDO is including carbon management as a significant effort in the OCRC. Questions to consider include the suitability of depleted oil and gas fields, un-minable coal seams, and deep sandstone formations in Ohio for sequestration of CO<sub>2</sub>; processes for separation of CO<sub>2</sub> from flue gases which limit the cost of electricity increase to 35 to 40% above current prices; chemical processes, which yield hydrogen-rich fuels from Ohio coal and nearly pure streams of CO<sub>2</sub>; and the impact of impurities in compressed CO<sub>2</sub> (such as SO<sub>2</sub>, O<sub>2</sub>, H<sub>2</sub>O), NO<sub>x</sub>, and air toxics) on its suitability for pipeline transportation to a disposal well and disposal in geologic formation of Ohio. Specifically there is interest in developing details of systems suited for movement of CO<sub>2</sub>, contaminated with SO<sub>2</sub>, and air toxics short distances from power plants burning Ohio high sulfur coal to near by deep disposal wells in Ohio.

OCDO is also interested in developing or advancing technologies related to the use of coal for:  
1) production of hydrogen for fuel or chemical applications and CO<sub>2</sub> streams suitable for

sequestration; 2) production of feed streams from coal suitable for use in processes that yield chemicals and liquid fuels; 3) development of fuel cells that use coal syngas or streams derived from coal syngas as fuel and 4) methods to reduce the cost of producing oxygen for syn fuel gas production. In addition, OCDO is interested in direct coal fuel cells and chemical looping processes that convert coal directly into hydrogen, to produce electricity, or for fuel or chemical applications and CO<sub>2</sub> streams suitable for sequestration or lead to other methods for conversion of coal into usable energy.

OCDO is also interested in retro-fitting the existing PC fired fleet of power plants for oxy-fired combustion as a possible method of generating a CO<sub>2</sub> stream suitable for sequestration. There is also interest in oxygen blown gasification as an approach to obtain CO<sub>2</sub> streams suitable for sequestration. In either of these applications, the cost of oxygen separation from air is a major factor in the overall economics of the processes. Therefore, the CRC is interested in projects that lower the cost for oxygen separation from air. This is a very active research area in industry, yet one often hears that a breakthrough may be a decade or more away. OCDO's goal will be to seek new and novel methods to achieve this separation that have a potential to greatly reduce the cost in \$/ton of oxygen produced.

#### **Goal A: Improve or reduce environmental emissions from coal combustion**

The Ohio Coal Development Office has been supporting research to develop CO<sub>2</sub>, sulfur, nitrogen oxides, and mercury control systems for retrofit applications on coal fired boilers. OCDO has also been supporting work to develop advanced coal technology for electricity generation systems, such as IGCC, coal to hydrogen, iron looping, and coal direct fuel cells. Based on recent economic studies of IGCC and syngas to hydrogen processes, a number of areas have been identified as being significant cost adders to these advanced systems (for example IGCC). The air separation unit (ASU) is a significant capital cost and a significant energy consumer. Ways to reduce or eliminate the capital cost and energy consumption of the ASU would make coal more competitive. The Ohio Coal Development Office is seeking research which would improve the cost competitiveness of coal to electricity generating approaches and to develop other, lower hydrogen to carbon mole ratio products which can reduce our demand for oil and produce either intermediate chemicals or final products. Several areas of potential research include, but are not limited to:

1. The Ohio Coal Development Office is currently supporting the following research areas: calcium looping processes, iron chemical looping processes, membrane research to separate hydrogen from nitrogen and CO and oxygen from nitrogen, and coal direct fuel cell research to control CO<sub>2</sub> emissions, improve hydrogen product purity, and/or improve efficiency of existing boilers. We are seeking novel sorbents, techniques, and processes to capture CO<sub>2</sub> emissions from coal

combustion from existing boilers. We are requesting that the proposer include the cost comparison of any new reagent vs. the existing reagent, the sorption/desorption step energy requirements, the operating temperature of the sorption/resorption step, and compare the energy penalty to MEA systems. The objective is to capture 90% percent of the CO<sub>2</sub> at no more than a 35% increase in the cost of electricity.

2. Currently for syngas to hydrogen processes, gasification step uses oxy-firing and in many cases reheating the syngas to water gas shift reaction temperatures. The Ohio Coal Development Office is seeking novel reagents to replace the oxy fired syngas generation step there by lowering the capital cost and energy penalty associated with the air separation unit. For example, the reaction step  $\text{CO}_2 + \text{C} \rightarrow 2\text{CO}$  could be used to gasify coal. If you propose a scheme under this area, include an energy balance with the proposed gasification scheme and compare to producing 95% purity O<sub>2</sub> at 200Kwh/metric ton of O<sub>2</sub> or to remove H<sub>2</sub>S and other syngas contaminates, compare the novel reagent cost to current reagent cost, for example zinc.
3. The Ohio Coal Development Office is seeking novel high volume products that can be made from coal. This area could include chemical feedstock with lower H/C mole ratio than gasoline or diesel fuel, new products such as carbon fibers, and other materials/chemicals. The proposal should include a cost estimate for the new product unit cost.
4. While there has been much research to develop lower cost, lower energy penalty oxygen separation processes and low cost hot gas clean up systems, to date no one has succeed. The Ohio Coal Development Office is seeking novel research for either oxygen separation (OCDO is currently supporting membrane research and membrane research should not be proposed under this RFP) or hot gas clean up (OCDO will not consider research which is a follow-on to research which DOE or others have supported). Please include an estimate of the cost and energy penalty associated with the proposed process.

### **Goal B: Sequestration of CO<sub>2</sub> in Geological Formations**

The Ohio Coal Development Office is seeking to understand the geological implications of large scale CO<sub>2</sub> sequestration. We have identified a number of areas that could be of interest to this Office. They are:

- 1) Studies to understand subsurface analysis and mapping
- 2) Variability of geological units. For example, the variability of Mount Simon, Rose Run, and Copper Ridge formations.
- 3) Variability of the cap rock. Is the cap rock semi permeable or have fissures been formed that could allow CO<sub>2</sub> to leak out of the sequestration zone.

- 4) To increase the CO<sub>2</sub> sequestration rate can the receiving formation be fractured without compromising the cap rock? How will these formations fracture? Are these formations currently fractured?
- 5) What are the chemical and physical properties that can be used to map and characterize formation variability.
- 6) Conduct reservoir scale modeling for heterogenous formations in Ohio

**ELIGIBILITY** – This solicitation is limited to universities located within the State of Ohio. Causes for rejection of a pre-proposal or pre-proposal addendum without detailed review (in no particular order) include, but are not limited to:

- applicant is not an Ohio university
- proposal is not received by the 5:00 PM May 23, 2011 submission deadline
- pre-proposal does not contain Attachment 2 and an original signature by an authorized school authority
- proposed work is outside the topic area of this solicitation
- proposed work is too broad and not focused
- pre-proposal or pre-proposal addendum fails to meet the solicitation format requirements
- proposal duplicates other work by EPRI, US DOE, US EPA or others
- proposals for continuation of active projects did not demonstrate progress in the prior year
- proposed work and associated budget is not feasible or reasonable
- proposed budget does not meet the required cost share
- budget otherwise fails to conform to requirements set forth in this solicitation
- OCDO does not fund black boxes – the pre-proposal and pre-proposal addendum must identify clearly chemical reactions, compounds, processes and other details that are core to the proposed research. If the information is considered to be a trade secret as defined in Section 1333.61 of the Ohio Revised Code it shall be treated accordingly. **However, it is solely the proposer's responsibility to conspicuously identify and mark only those lines, diagrams, etc. or portions of the document containing trade secret information. Entire proposals or entire pages so marked cannot be deemed as confidential**

**PROPOSAL FORMAT** – The total length of the pre-proposal should not exceed **ten (10) pages plus attachment 2**, in size 10 Arial font, with one-inch margins on all sides and double spaced. The sections of the proposal must include the following:

1. **Cover Page** - complete all sections of Attachment 2 and attach it as the top page of the pre-proposal. Attachment 2 must have an original signature by an authorized school authority. Attachment 2 does not count toward the five-page text limit.
2. **The Objective** – a brief statement should be presented of the specific goals for each year of a two-year project (approx. 1 page). It is essential that the pre-proposal clearly state the objectives and the basis of the proposed work and very preliminary economic rationale for the proposed work (what is the driving force to conduct the work).
3. **Background and literature review** – this discussion should define the state-of-the-art of the proposed concept, process, etc., covering only the most important points and showing how the proposed work is a logical next step forward. This discussion should include key chemical reactions, or process concepts to be studied (approx. 2 pages). For proposals that are requesting continuation of current consortium projects, this section should also include a road map to commercialization, i.e. where is the work at the present time and what steps remain to be completed before commercialization is possible.
4. **Presentation of key data and economic rational for the work** – key data from the previous year’s work or preliminary data for new projects should be presented with discussions supporting the tasks proposed in the statement of work for this year’s solicitation (approx. up to 5 pages).
5. **Statement of work** – a detailed discussion should be presented on tasks to be completed in a two-year project. The presentation should be clearly divided into two sections, one for year one and a second for year two (approx. 2.0 pages).
6. **Reference list** – brief (approx. ½ pages).

Space should not be used in the proposal explaining how the proposal is related to the research topics listed above in this solicitation nor to the question of how the proposal will advance usage of Ohio coal. If these points are not self evident in the proposal, it will be dropped from consideration.

7. **Project Personnel and Responsibilities** – Identify the Principal Investigator (PI) and Co-PI, if any, who will be the person directly responsible for the completion of the project within the grant agreement’s parameters, including adherence to the SOW

and project budget. Provide *curriculum vitae* (CV) of the PI and Co-PI and other major project personnel as an appendix to the proposal. While the CVs will not count toward the five-page limit, CVs exceeding three pages are discouraged – include what is appropriate to this proposal.

8. **Publications and Patent Applications** – Attach abstracts of published, peer-reviewed papers and abstract of patent applications filed, based upon past consortium projects. These attachments will not count toward the 10-page limit or the proposal.
9. **Project Budget** – A budget specifying OCDO and the proposers cost share must be presented by line item using **Attachment 3** (the total OCDO funds and university cost share should be the same as on the attachment 2 of the pre-proposal). In addition, a budget justification section should be presented defining the following: **a)** all PI, Co-PI, and student time charged to the OCDO and/or provided as cost share; and **b)** an Equipment List and justification for each piece of equipment to be purchased. Additional sheets may be included in order to clarify the budget if necessary. Attachment 3 and the budget justification will not count toward the ten-page text limit.
10. **Gantt chart** – a detailed Gantt chart with a time line for each task and subtask of the SOW should follow the SOW. This chart will not count toward the ten-page limit.
11. **Leveraging of OCDO Funds** – Proposers should attempt to use grants from OCDO in leveraging co-funding from other sources such as federal funds or other state or private funds for the project. An executive summary of any companion proposal(s) submitted to US DOE, other federal, state or private entity or funding program should be attached as an appendix to the proposal. The anticipated decision date and funding timeframe of companion proposals should be included. This will not count toward the ten-page limit of the full proposal addendum.

**FUNDING:** Funding for two-year projects that start on September 1, 2011 and end on August 31, 2013, will be up to \$100,000 for two years with expenditure limits of up to \$50,000 of the project costs per project year. Proposer cost share for the two years would be 50% or more of the project cost. For example, an OCDO grant of \$100,000 would require minimum proposer cost share of \$100,000. Proposer cost share should be provided throughout the two years in proportion to the release of OCDO funds. Special consideration will be given to projects that use OCDO funding to leverage federal or other third-party matching funds. Special consideration will be given to projects that use OCDO funding to leverage federal or other third-

party matching funds. The proposal should specifically state if third party funding is included in the proposed project, and include a copy of executive summaries of proposals made to third parties in an appendix to the pre-proposal addendum. Other details and restrictions on funding are as follows:

1. OCDO will fund equipment necessary to complete the work up to 50 percent of its actual cost. Upon successful completion of the project, title to the equipment will be granted to the school. The proposer may count the other 50 percent of the equipment's cost toward cost share.
2. During summer months, OCDO shall fund up to a total of two months faculty time. The two months can be divided between the PI and Co-PIs as appropriate for the project. Actual charges will be based upon 1/12 of the academic year base salary of the PI and Co-PIs and their portion of the two-month limit. Faculty compensation during the academic year is not an allowable cost. Otherwise, unlimited additional faculty time may be funded by the participating school and/or by a third-party funder and counted toward the required cost share.
3. Graduate student costs shall be at school's regular rates for the appropriate level of the student.
4. Travel in the project budget (as opposed to the CA budget) should be limited to actual travel necessary to complete the project (example: a car trip between one school and another in order to collaborate research or a trip to a "Consortium" meeting). Do not include travel to conferences to present papers, as that is included in the CA Administration budget. (However, please note in your proposal if you intend to present at a conference, as it will help in the preparation of the Administration budget.) With the possible exception of Canada (with strong justification), no international travel will be reimbursed by OCDO.
5. Overhead charges shall be kept to a minimum. However, overhead charges may be used as part of an institution's cost share commitment, provided that federally approved, auditable overhead rates are used. Overhead charges, if any, to OCDO cannot – in any case exceed the university's federally negotiated rate for research.
6. All OCDO grant agreements include clauses that make grant awards and continuations contingent upon both availability of funds and appropriation authority.

**AWARD DELIVERABLES** – Following approvals and execution of legal agreements as noted above, some of the basic requirements of the grant and subcontracts are as follows:

1. Quarterly status reports, describing technical progress, must be prepared covering the periods September 1 – November 30; December 1 – February 28; March 1 – May 31; June 1 – August 30 for each of the two years of the project. A final project report will also be required, which summarizes accomplishments over the two years of the project. These reports must be completed according to a format to be specified in the grant agreement. Reports are to be submitted to OCDO, including one paper copy and an Adobe Acrobat PDF file on CD.
2. Financial reports, in a standard OCDO format, must be submitted summarizing the project financial status, including actual project expenditures to date, and grantee cost share. Invoices must be submitted quarterly, for periods corresponding to the project performance period. All invoices must bear sufficient documentation to back up both charges to the grant and the total cost share expended.
3. **NOTE WELL** – If invoices are not submitted to the CA within 45 days of the close of a quarter, the university shall forfeit the funds for the period. However, such forfeited funds may count towards the university's project cost share.
4. Administrative reports, indicating project employment on the Exhibit G of the Grant Agreement and cost projections, must be submitted.
5. Proposers should plan to attend up to one mandatory meeting with the full OCRC each year to present the progress to date on their project, to collaborate with others in the OCRC, and to review various on-site demonstration projects.
6. Each university shall execute a payment agreement with OCDO that enables the State of Ohio to receive a commercially reasonable portion of any revenue stream (via the sale, lease, license, etc.) derived from the work supported by OCDO funds.

**TRADE SECRET INFORMATION** – All information submitted in response to this RFP shall be public information unless it is determined to be "trade secret," as it is defined by Section 1333.61 of the Ohio Revised Code. Any information submitted with the proposal, which the proposer deems a trade secret shall be treated accordingly, if the information is determined to be a trade secret under the laws of the State of Ohio. In the event the proposer submits trade secret information, **it is solely the proposer's responsibility to conspicuously identify and**



persons knowledgeable in the field of the proposed project. The points are a guide for the CRC, but not determinative.

**Criterion 1: The overall merit of the proposed project (0 to 5 points)** – The research represents a significant contribution to expanding the base of knowledge in the defined focus area. The proposed approach is innovative and represents a significant departure from state-of-the-art approaches to the described problem. An awareness of the state-of-the-art in related areas of coal research is demonstrated.

**Criterion 2: The stated objectives and probability of achieving those objectives (0 to 5 points)** – The application clearly addresses a problem, concept or question described within the research areas A, B, and C defined above. A well-defined, logical statement of work is provided to effectively address the technical issues. An approach is described that is scientifically sound, well planned and uses current methods (or methods adequate to solve the problem) in the investigation.

**Criterion 3: The facilities or specialized equipment and techniques available to the applicants to meet the project objectives (0 to minus 2 points)** – Points will be deducted from the proposal if key equipment or techniques are not available or not included in the list of equipment to be purchased by the project.

**Criterion 4: Leveraging of cost sharing funds from industry or government sources (-1 to 2 points)** – One goal of the OCRC program is that OCRC support will be used as cost share in proposals submitted to other sources of government and industrial funding. The university would be expected to maintain its cost share at 50% (or greater) of OCDO's contribution to the project. The outside funds would be used to either expand the program or reduce OCDO's contribution to the project. Executive summaries of companion proposals must be attached as an appendix to demonstrate the attempt to leverage third part funding. OCDO staff will assign scores on this criterion as follows:

- -1 if no effort was made to obtain outside funding
- 0 if projects have tried but were declined outside funding
- 0 if projects have tried for outside funding but have not received a decision
- 2 if projects have received outside funding

**Criterion 5: Publication of research in peer-reviewed journals and applications for patents (-3 to a maximum of +3 points)** – For projects that have received OCRC funding for a number of years, it is expected that by the end of the third year that a paper has been submitted to a

peer-reviewed journal for publication and/or a patent application has been filed. OCDO staff will assign scores on this criterion as follows: +2 for the filing of a patent application; +1 for each peer-reviewed paper submitted for publication; and -3 if after completion of three years of work, neither a patent application has been filed nor a peer-reviewed paper has been submitted for publication.