CDAC was formed under the authority of Act 52 of 2016. That Act requires CDAC to submit an annual report of its activities and recommendations. Accordingly, CDAC submits the following.

**Meetings:** This Second Annual Report summarizes meetings held May 24, 2018, September 27, 2018 and January 24, 2019.

**Members and Terms:** Act 52 determined the structure of the Advisory Council, with a total of 17 members. The Council is comprised of two Cabinet Secretaries (PA DCED and PA DEP), four legislative members (representation from each of the four caucuses) and 11 members appointed by the Governor from a variety of industry sectors and organizations including, The Pennsylvania Independent Petroleum Producers, the Pennsylvania Independent Oil and Gas Association, the Pennsylvania Grade Crude Oil Coalition, representation from refineries of Pennsylvania Grade Crude oil, an academic hydrologist, and academic geologist and a nonprofit corporation that promotes the conventional oil and gas industry in Pennsylvania.

Act 52 also determined the initial and successive term lengths of the members appointed by the Governor. Four members serve an initial term of one year, four members serve an initial term of 2 years and three members serve an initial term of three years. After the initial term is served, members appointed by the Governor serve three-year terms. A member, upon expiration of the term, shall continue to hold office until a successor is appointed.

Members of CDAC are (initial term length in parenthesis):

1.) DCED Secretary Dennis Davin
2.) DEP Secretary Patrick McDonnell
3.) Senator Scott Hutchinson
4.) Senator John Yudichak
5.) Representative Martin Causer
6.) Representative Ryan Bizzarro
7.) Mark Cline (3 years)
8.) Joe Thompson (1 year)
9.) David Ochs (3 years)
10.) Burt Waite (2 years)
11.) Bruce Grindle (3 years)
12.) Arthur Stewart (1 year)
13.) Nick Andreychek (2 years)
14.) Jeannine Schoenecker (1 year)
15.) John Philliips (2 years)
16.) Dr. Terry Engelder (1 year)
17.) Dr. Richard Parizek (2 years)

**Officers:** During the year addressed by this annual report Arthur Stewart completed the second year of his term as chairman and Mark Cline the second year of his term as Vice Chairman.
**Administrative Support:** Throughout the year DCED provided administrative support including establishment of meeting locations, communications coordination, maintenance of website materials, record keeping in the form of draft minutes, organization of meeting materials, and agenda formation, and in general served as a source of support for all administrative matters. Zachary Reber initially served as the primary point of contact, succeeded by Adam Walters.

**Council Actions:** CDAC submitted comments regarding two Technical Guidance Documents published by the PA DEP (TGD 012-1920-002 related to Advisory Committee Guidelines and TGD 012-0820-001 related to the development and review of regulations). CDAC also agreed to join with the PA DEP in the sending of a letter to the US Coast Guard objecting to the Coast Guard’s treatment of PA surface landowners as parties responsible for orphan well plugging when the surface owner has no ownership interest in either the orphan well or the underlying oil, gas and mineral estate.

**Reports and Actions by Committees and Member Groups:**

1) **Legacy Well Committee:** The Committee continued its work concerning orphan and abandoned wells, refining its studies concerning the number of such wells and how the wells are prioritized for plugging. Excellent cooperation existed between DEP and industry representatives as CDAC explored how the DEP’s system of prioritization could be best understood by industry and applied to the tens of thousands of orphan wells not currently identified in the DEP’s orphan well inventory.

Finding adequate funding for the plugging of orphan wells remains a frustration for all CDAC members. CDAC members from DEP, the conventional industry, DCED and the PA Legislature worked closely to examine plugging grants made available through the Commonwealth Financing Authority (CFA). Observing that only $20,000 of plugging projects (from requests totaling $450,000) were approved in the preceding year, the Legacy Well Committee and the entire CDAC Board spent considerable time examining the CFA application and award process and discussing how the same might be modified for greater plugging success. The Committee developed a list of specific suggestions and CDAC authorized the Committee to discuss the same with the executive director of the CFA.

The revised Conventional Oil and Gas Act (COGA), which was reported on in CDAC’s first annual report, contained provisions to incentivize members of the convention oil and gas industry to voluntarily plug orphan and abandoned well. While the COGA was approved by the PA House and the PA Senate ERE Committee, the legislation did not come before the full PA Senate for vote before the conclusion of the 2017-18 legislative session. Nevertheless, the Legacy Well Committee continues to study incentivization legislation adopted by other states and to discuss legislative alternatives that would fit Pennsylvania’s need. The Legacy Well Committee is postured to make specific legislative suggestions in the event a revised COGA is advanced by members of the Legislature.

The Committee also participated in a multi-member workgroup convened to assess how the regulation of well plugging can be made more efficient to both reflect successful field developments and reduce plugging costs while maintaining or improving environmental benefits. The Committee reports that the workgroup marks another example of good cooperation between members of the conventional oil and gas industry and the DEP, with
significant early progress being made on the matters of the pulling of well casing and the employment of data sheets for pre-plugging assessment.

A detailed report from the Legacy Well Committee is attached hereto as Appendix A.

2) **Produced Water Committee:** The Committee members continue to work closely with treatment plants, and CDAC received numerous reports from the Committee concerning new plant operations in Titusville and Bradford, PA.

In September 2018, CDAC hosted US EPA representative Jesse Pritts, who was participating in a federal study to understand produced water management and challenges across the country. Mr. Pritts reported that PA is something of an anomaly because its geology makes it unsuitable for underground disposal of produced water. In contrast virtually all other states dispose of produced water underground and he reported that since the early 1980s, federal regulations have mostly prevented produced water from being discharged to surface waters. He reports that changes in both the needs of the oil and gas industry and the availability of treatment technologies have led to questions about industry’s ability to continue to manage its produced water under the current zero-discharge provisions. Through national outreach, EPA intends to explore best practices, the constraints of produced water management, and the extent to which increased opportunities for the treatment and discharge of produced water is something that is supported by stakeholder groups across the country. Mr. Pritts asked for input as to seven matters and in a cordial dialogue the CDAC members provided substantive responses to Mr. Pritts’ inquiries, which dialogue included a history of the handling of produced water in PA as well as the cost and difficulties associated with current treatment methods.

Also visiting CDAC in September was Penn State Professor William Burgos who co-authored a study which examined some of the questions involved in radium in produced water and how that radium behaves in the context of brine spreading for dust suppression. CDAC discussed with Professor Burgos some of the questions not addressed in the study he co-authored, how those questions might be examined, and how the pre-treatment of brine might be employed to address the presence of radium and other materials contained in produced water. The dialogue with Professor Burgos was part of the catalyst for the formation of two special committees tasked to the further study of brine spreading for de-icing and dust suppression, and the work of those committees is addressed under “Brine Spreading” immediately below.

A detailed report from the Produced Water Committee is attached as Appendix B.

3) **Brine Spreading:** At public comment at various meetings during the year the presidents of PIOGA and PGCC complained to CDAC about the oil and gas production constraints and the economic hardship suffered as a result of the dwindling number of produced water options. Among other things the presidents of the trade organizations called upon CDAC to direct its efforts to the re-initiation of the brine spreading/dust suppression program suspended by the DEP, but which had operated previously for several decades.

In discussing the brine spreading program with Professor Burgos and DEP staff there arose the question of the scientific data upon which the DEP had historically authorized the spreading of brine. That question went unanswered at the September 2018 CDAC meeting, but prior to the next meeting PGCC located and provided to CDAC the October 1996 DEP report entitled “Non-
Point Source Report On Roadspreading of Brine For Dust Control and Road Stabilization.” That report summarized data collected as a result of a joint effort by the DEP and EPA, which effort included monitoring wells and other sampling measures. The report is the basis upon which the DEP authorized the road spreading of brine employing certain temporal and quantitative limitations.

As a result of reviewing the information contained in the 1996 Report and preliminary discussions undertaken by members of the Produced Water Committee and Dr. Burgos, CDAC determined to undertake two tasks related to its mission of addressing the produced water problem. At the January 2019 meeting the tasks were assigned to two special committees as follows:

1) Impact Study Committee: This committee was asked to meet with DEP to determine how the former program of monitored brine spreading upon dirt roads can be reinstituted in time for road stabilization efforts commencing spring 2019. The committee is charged with employing the “new” information contained in the 1996 Report (cited above) to address the DEP’s previously articulated concern about authority for the program. The committee is specifically requested to review, with the DEP, the various means by which the road stabilization and dust control program can be authorized, and the DEP’s purposeful election in 1996 to choose authorization via the guideline program instead of the general permit. If the discussion reveals any reason why the 1996 election is not relevant in 2019, the committee should identify the obstacles to relevancy and recommend options for resolving the obstacles.

2) Treatability Study Committee: This committee was asked to meet with the DEP to discuss transitioning conventional oil and gas produced water from waste to an alternate characterization. The discussion it to include the necessary water quality for alternate characterization, the means of achieving that quality, including the testing of batch treatment (under the Burgos, Waite, Parizek proposal), and the administrative process necessary to memorialize the transition (including the possibilities of de-wasting, characterization as product etc.). Since the anticipated work includes the testing of batch treatment, a source of funding must be secured; therefore, the committee is asked to continue the discussions initiated by the Commissioners of Warren County regarding funding and the possibilities of economic development. The committee was reminded of Mr. Perry’s suggestion that, at the DEP, the discussion will include not only the bureau of oil and gas but also the bureau of waste management.

4) Economic Committee: Throughout the year the Economic Committee reported to CDAC on the closure of local natural gas pipeline systems due to the shortage of conventional gas supply. In southwestern PA the problem has resulted in the closure or threatened closure of certain small gas systems. To develop options for remediation the Committee met with the Center for Rural PA and asked DCED for assistance through any available DCED program.

The Economic Committee provided economic data for the September 2018 meeting with the EPA, and at the January 2019 meeting the Economic Committee gave a presentation demonstrating how the development of unconventional shale formations across the US has played a role in transforming the world oil and gas market which has helped create unique difficulties for PA’s conventional oil and gas industry.
The presentation had great impact upon the CDAC members with several noting it engendered a new or significantly improved understanding of the difficulties bearing on PA’s conventional oil and gas industry. While it is beyond the scope of this report to reproduce the entire presentation, some salient elements should be noted:

First, the unconventional shale development has radically transformed this country’s oil and gas supplies:

- The oversupply of gas has resulted in ten years of shockingly low gas prices, and the oversupply of oil saw oil prices collapse five years ago. Virtually no conventional gas wells have been drilled in PA in the past 7 years and new oil well starts have dropped precipitously:

- A resurgence in oil prices in early 2018 injected some optimism, but in November 2018 oil prices began a drop of some 40%, and by year’s end only 139 new conventional wells had been drilled.
The two refineries purchasing PA Grade Crude Oil contributed data showing that their amount of crude oil sourced from PA has dropped dramatically over the past ten years, resulting in higher operating costs. Illustrative is the chart provided by ARG Refinery showing that it is currently raling in 70% of its crude supply from distant destinations such as Canada and New Mexico:

The presentation showed how these market difficulties combined with additional regulatory burdens such as additional casing requirements and reporting requirements, have created a business operating atmosphere in which closures and layoffs have been rampant. That loss of infrastructure has also led to supply and service chain shortages which reduce competition and further hike costs.

The presentation concluded by examining projected supply and pricing trends, all of which bode for a continued depressed drilling and operating environment, within PA’s conventional oil and gas industry, for the foreseeable future.

It was agreed that the presentation was a valuable teaching tool. From that observation arose the discussion that CDAC should add to its future goals the obligation to educate about the conventional oil and gas industry, including the vital economic role the industry plays in the economy of western PA and the extraordinary economic pressures incumbent upon the industry. It was also agreed that it would be valuable to update the presentation annually for regular presentation to the CDAC membership. It was unanimously felt that the presentation covered key data points which (when updated) would be useful to review on an annual basis.

5) Regulatory Review Committee: The Regulatory Review Committee met in April 2018; the committee discussed procedure including how to create a welcoming environment for all comments, interaction with other CDAC committees, and a framework for categorizing comments so that topics with readily identifiable common interests could be advanced before others. The committee addressed a list of Chapter 78 topics brought to the committee by co-chairman Perry. Comments were recorded and the topics were categorized as discussed. In
light of the DEP remarks at the May 2018 meeting that the DEP looked forward working on amendments to the Conventional Oil and Gas legislation then pending in both the PA House and Senate, Mr. Perry and Mr. Stewart made a joint recommendation to the Council that further work on regulations be suspended, the hope being that work on regulations would be most efficient if tailored to a Conventional Oil and Gas Act. The Council agreed.

No additional regulations were brought to CDAC for consideration during the remainder of the year and, therefore, the Regulatory Review Committee did not again meet.

6) PA DEP: At the May 2018 meeting the DEP offered positive comments about CDAC’s role in the development of the revised COGA, the usefulness of a revised COGA, and the DEP’s intention to offer constructive input upon COGA as legislation was developed.

At all this year’s meetings the DEP updated the CDAC membership as to technical guidance documents under consideration or new programs or regulations that have bearing on matters within CDAC’s purview. These included matters such as revision of the spill policy, gas storage, and coal coordination issues.

CDAC received favorably word from the DEP that it is partnering with DCNR to plug orphan wells located upon PA state forests. Over the course of the year DEP informed that the planning was focusing upon the Corplanter State Forest with hopes of spending approximately $2 million in the plugging of orphan wells thereon.

At the January 2019 meeting, CDAC members inquired whether the draft RACT regulation concerning VOC and other emissions, presented by the DEP to the Air Quality Technical Advisory Committee, would have applicability to PA’s conventional oil and gas industry. The DEP indicated it would follow up but that at that time the DEP did not see the conventional industry coming under the requirements.

From the Chairman: I was pleased to report last year upon the “spirit of listening and cordiality (that) permeated (CDAC’s) process, resulting in improved understanding of issues and resulting in agreement on a number of matters that, a few years ago, might have been unthinkable.” It is fair to say that a similar spirit prevailed in our second year of work.

At our May 2018 meeting it was gratifying to hear the complimentary remarks offered by our DEP representatives about CDAC’s role in developing the revised Conventional Oil and Gas Act. It is similarly gratifying to observe the process that unfolds as members of industry, academia and DEP work together to create presentations and recommendations for CDAC meetings. As I watch documents develop it is often impossible to recognize where the work of one member ends and the work of another member begins—there exists creativity and meeting of the minds that makes the work products true joint efforts.

This is manifested time and again. Illustrative is our work with Dr. Burgos. Not only are we striving to understand the foundation of the historical brine spreading program in hopes of re-commencing it; we are also looking at methods for how brine might be pretreated in new and hopefully economical ways. The path was not necessarily foreseen by any single CDAC member, but when the minds of Dr. Burgos, Dr. Parizek and Mr. Waite combined, the new path was born.
It is also gratifying to observe tangible results from CDAC’s prior work. In our first year of operation CDAC issued a call to action to encourage the voluntary plugging of orphan wells. CDAC has received reports of the call being answered on several occasions, including the plugging of a well upon the Allegheny National Forest (ANF) where the ANF contributed help in gaining access to the site, where PGCC members contributed the equipment and materials to plug the well, and where the DEP streamlined the Good Samaritan application and assisted with the site remediation. We can celebrate this not merely as the removal of another well from the list, but also as a signal of understanding and cooperation that can and will be replicated on other fronts.

It is beyond doubt that in our second year of operation we excelled in meeting the charge under Act 52 that we:

(6) Provide institutional support for the conventional oil and gas industry of this Commonwealth by ensuring effective cooperation and communication among governmental agencies and the academic and research community.

I think, too, that our efforts worked generally toward achieving the charge under Act 52, that CDAC promote the long-term viability of the conventional oil and gas industry. However, the report of the Economic Committee at our January 2019 meeting was a sober reminder of the gravity of both the task and importance of outcome. Many communities rely in great part upon the continued health of the conventional oil and gas industry—that health is not good.

An industry’s infrastructure can continue in survival mode only for so long, and the Economic Committee’s report contained several data points and anecdotes that suggest PA’s conventional oil and gas industry’s fabric is being stretched to the near-breaking point. That is not good for any of our stakeholders, the refineries that require our oil, the small natural gas systems that rely upon conventional gas wells, the communities that rely upon our industry as a key source of employment, and the DEP that relies upon our industry for its well plugging expertise and the care our industry provides to the 100,000-plus active wells that dot western PA.

Knowing these challenges helps focus our work at CDAC. We must keep open the lines of communication about changes in guidance or regulation that could affect the delicate survival mode in which the industry now operates. We will continue to spend much of our available time exploring creative remedies for the produced water problem. We must educate about the unique niche our industry occupies. And a revised Conventional Oil and Gas Act that protects the environment and removes some of the ill-fitting Act 13 burdens will create a more fitting work environment.

CDAC can accomplish these things only with the continued participation of its volunteers. That participation over the past year has been commendable and the most important duty of this reporter is to thank the many individuals who have given so generously of their time. I am continually pleased and grateful that the attendance at CDAC meetings and committee meetings is near perfect. It has been a privilege to serve as chair, teamed with such a fine group of hard-working people.

Respectfully submitted,

Arthur Stewart
Chairman
Points of Focus in 2018

• Identification and plugging prioritization of orphan, abandoned, and legacy wells
• Increasing efficiencies associated with plugging projects
• Investigation of potential sources of funding for plugging orphan and abandoned wells and incentivization of the plugging and the rehabilitation of wells

During the spring of 2018, a Well Plugging Workgroup was formed to focus on the first two points listed above. Understanding that the technical and practical challenges associated with well plugging are not unique to the conventional oil and gas industry, the group consists of the following entities:

- PA Grade Crude Development Advisory Council (CDAC)
- Oil and Gas Technical Advisory Group (TAB)
- Pennsylvania Independent Oil and Gas Association (PIOGA)
- Pennsylvania Independent Petroleum Producers (PIPP)
- Pennsylvania Grade Crude Coalition (PGCC)
- PA Department of Environmental Protection (DEP)

The Well Plugging Workgroup’s objective is to develop and manage a common-sense approach to prioritizing plugging candidates and establish methods for streamlining the well plugging process. To date, the points of focus consist of the following:

1) **DEP orphan and abandoned scoring sheet:** Over the years, the DEP has relied on a scoring system to grade wells within the DEP’s orphan and abandoned well database. These wells are evaluated on a series of criteria to quantify the level of risk to public safety and to environmental pollution. The existing scoring system is effective, but an idea to simplify the evaluation matrix and reduce the subjectivity of individual scores has been discussed. DEP has recently taken significant steps to limit redundancy and improve the reproducibility of its well scoring protocol based on stakeholder feedback.

It has also been suggested that a derivative of the scoring method be applied outside the realm of the DEP and be applied to privately owned well inventories. Resources available to plug wells are limited and all stakeholders must focus those resources on the correct plugging projects. The external system needs to be a dynamic one, where DEP Mechanical Integrity Assessment data can also be used to adjust the priority of projects on a regular basis. In most cases, the number of wells plugged should be secondary to plugging the wells with the highest level of risk. Exceptions may exist when cost savings could be realized by plugging multiple wells in the same area or when agency compliance actions are necessary. Even in the latter case, wells should be prioritized in accordance with a risk-based approach. There has been at least one example of an operator using this system to more efficiently manage its plugging obligations.
2) **Proposed well data sheet:** The process of plugging a well can be very abstract, meaning it is not uncommon for the best laid out plans to become less relevant once the wellbore has been entered. To compound these problems, overly prescriptive regulations and subjectivity in their interpretation often lead to job inefficiencies and unnecessary costs. In an effort to avoid, or at least minimize those problems, the Workgroup has proposed a Well Data Sheet concept. The highlights and benefits of this concept are:

   a) Operators can voluntarily choose to submit a form to the DEP along with the required Notice of Intent to Plug a Well and the Alternate Methods and Materials forms.

   b) The information on this data sheet can demonstrate that the operator possesses the necessary information to make proper decisions when circumstances dictate a modified plugging plan.

   c) In advance of initiating plugging operations, the DEP has the opportunity to review the data and provide technical input.

A proposed practical result of such a data sheet is to give the operator authority to make a determination of attainable bottom during plugging operations. Rig time and delays have been shown to contribute significantly to plugging costs. The information used to make such a decision will be assembled and vetted prior to the time the when a decision needs to be made in the field.

A sample well data sheet has been developed and a presentation has been given to the DEP. The value of the concept is understood and has been well received. This topic will remain a priority of the Workgroup in 2019.

3) **Interpretation of laws and regulations:** Presented to both CDAC and the Well Plugging Workgroup, the Legacy Well Committee illustrated a need to review and clarify the regulations for well plugging and the laws that govern them. Conflicting plugging requirements that lead to increased confusion and inefficiencies, as well as increased costs, were presented to the groups. Examples include:

   a) The specific requirements to plug oil and gas wells drilled in coal areas are defined in Pa. Code Title 25 § 78.92-93. Included in the Chapter 78 regulation in the context of plugging to mine-through standards is the language, “The gas well shall be plugged in accordance with the Coal and Gas Resources Coordination Act No. 214”. At one time, the regulations for plugging wells in coal areas found in Chapter 78 reflected the language in Act 214. Over the years, Chapter 78 has been modified and, as a result, disconnected from Act 214. This disconnect adds a significant and unacceptable layer of confusion among both operators and regulators. Not only do the regulations for well plugging in Chapter 78 need attention, but the laws they reference do too. This will be a continued topic of discussion among the CDAC Legacy Well Committee and the Well Plugging Workgroup. DEP has engaged counsel to conduct a legal review of the connections between the relevant statues and regulations.
b) During well plugging and abandonment operations, regulations require an attempt to retrieve uncemented surface casing from the wellbore. For a variety of reasons, the removal or the altering of the uncemented surface casing is not ideal. Through Workgroup discussion, the DEP has acknowledged the benefits of leaving uncemented surface casing intact and in the wellbore. As result of those discussion, the DEP has drafted a document, designed to inform operators and plugging contractors on how to apply the provisions found in 25 PA Code § 78.75 to an acceptable alternate method for plugging that does not require pulling or altering of uncemented surface casing. The document is expected to be publicly available in 2019.

c) Many oil and gas wells are registered with a “coal well” designation even though they do not penetrate a workable coal seam(s) as defined by DEP policy. There are significant differences between the methods used to plug coal wells verses noncoal wells. Additionally, the cost associated with plugging wells in coal areas can be substantially higher than their non-coal counterparts. Through the efforts of CDAC and the Well Plugging Workgroup, methods for appropriately reclassifying coal wells will be determined. This will provide operators and plugging contractors a more practical and cost-effective approach to plugging qualifying wells.

The CDAC Legacy Well Committee has examined both existing and potential future sources of funding for plugging orphan and abandoned well plugging projects. The Orphan or Abandoned Well Plugging Program (OAWP) is a grant program funded through the Marcellus Legacy Fund (MLF) and authorized by Act 13 of 2012. The MLF was created to provide for the distribution of unconventional gas well impact fees to counties, municipalities, and Commonwealth agencies. The fee revenue is used for statewide initiatives in the areas of acid mine drainage abatement, gas well management and plugging, development and rehabilitation of greenways and recreational trails, sewage treatment projects, replacement and repair of deteriorated bridges in municipalities with unconventional gas wells.

Only a small fraction of the total Impact Fee revenue is distributed to the Commonwealth Financing Authority (CFA), and its seven highly competitive grant programs, one of which is the OAWP. Figures 1, 2 and 3 contrast the source of funds - counties with unconventional well development, versus the counties that have received benefits through approved MLF grant funding. Illustrated in Table 1, the 7 CFA grant programs have achieved various degrees of success, but unfortunately the OAWP has not been a successful mechanism for combating the need to plug orphan or abandoned wells. The Legacy Well Committee has studied the OAWP program to determine why it has been under-utilized and will be engaging the CFA to discuss possible changes to the program that can increase the future success of the program.

Examples of possible changes include:

1) Policy Changes
   a) Increase the current grant cap of $250,000
   b) Allow and encourage companies who specialize in well plugging to submit grant applications and perform the work themselves
   c) Allow for a higher percentage of the grant amount to be used for engineering, oversight and administration
2) Administrative Changes  
   a) Incorporate guidance for securing liability relief  
   b) DEP assistance with acquiring landowner consent  
   c) Promote shovel-ready projects  
   d) Update guidance to reflect that grant periods may be extended  
   e) Provide clarity relating to Section III C. 7. Bidding Requirements of the OAWP Program Guidelines

Acknowledging that in order to effectively combat the growing need to plug or remediate abandoned wells that pose a threat to safety or the environment, the Legacy Well Committee has considered many different possible solutions for the funding of and the incentivization of well plugging. In early 2018, conventional oil and gas legislation was presented to the PA House of Representatives and the PA Senate. Included in the proposed legislation are two unique provisions designed to encourage additional well plugging.

Persons who voluntarily plug an orphan well may either:
1) Apply to the Commonwealth Finance Authority for a $5,000 payment per well plugged payable from the Marcellus Legacy Fund established under 58 Pa.C.S. § 2315 (relating to Statewide initiatives); or
2) Be credited for each plugged well in the form of a permit-fee waiver for any succeeding well permit application.

Summary
The CDAC Legacy well Committee and the Well Plugging Workgroup continues to strive to find ways to improve Pennsylvania by addressing the growing concern over orphan or abandoned oil and gas wells. These efforts will focus on new and existing incentive programs, improved regulatory landscape and the pursuit of new cost-effective methods and technology.
Figure 1

Unconventional Wells Drilled by County

Figure 2

CFA Funds Awarded Total Of All Years Per County
**CFA Funds Awarded 2018 Per County**

**CFA Distribution of Marcellus Legacy Fund**

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**Figure 3**

**Figure 4**

14
Committee Goals:
1.) Evaluate and promote all options, new and existing, for water disposal that will be economically viable for the conventional industry.
2.) Work with members of PIPP, PIOGA and PGCC and others who can offer insight into this issue.
3.) Study ways to use water or other products for enhanced recovery of oil.
4.) Study ways to recover marketable products from brine.
5.) Impress on the U.S. EPA the need to retain and expand the discharge of produced water to existing Publicly Owned Treatment Works (POTWs).
6.) Identify economically feasible treatment options that includes the reduction of TDS loads through salt removal.
7.) Encourage the development of additional water treatment facilities across the oil and regions of the State.
8.) Find ways to reinstate road spreading as a produced water management option.

Scope of the Problem:
- The low commodity prices for oil and natural gas continues to make it difficult for the conventional industry to adapt to decreasing water disposal options and increasing disposal costs.
- The number of treatment plants is also diminishing in part because of the low volume of water being disposed of because oil and gas production and new well drilling is down in relation to the depressed commodity prices.
- The lower number of plants to treat water results in increased cost for trucking.
- The rare and endangered species in the Allegany River and other streams further threatens economically viable treatment and discharge options.
- Pennsylvania has only eight disposal wells which constitutes a relative minor option for water disposal while other states have hundreds or thousands of wells and are the primary method of waste water disposal.
- EPA extension for discharges of treated water to POTWs may be curtailed in 2019 which may result in elimination of some of the few remaining disposal options open to PA conventional operators.
- Changes in the regulatory programs have made it increasingly difficult to treat and discharge produced water to surface water bodies. These changes include the “TDS Rule”, a pending “Chloride Rule”, the US Fish and Wildlife Chloride discharge limitations and existing and pending US EPA limitation for public ally Owned Treatment Works (POTWS) to accept and treat produced water.
- Changes in the Pennsylvania regulatory programs have made it increasingly difficult to permit and operate disposal wells and to obtain permits to spread produced water on dirt roads in the summer to control dust and on paved roads in the winter to control ice and snow.
- On October 30, 2018, FRS, the largest single commercial treatment operator in PA abruptly ceased operations at all four of their treatment facilities. Just as suddenly these facilities came back on line on December 14, 2018. The reliability of these and other disposal facilities is a concern to the Committee.
Committee Work Accomplished:

1.) The Committee and the entire CDAC met with representatives of the U.S. EPA to impress on them the importance of discharges of oil and gas waste water to POTWs.
   a. The success of new treatment and discharge facilities at Titusville and Bradford was emphasized.
   b. Pennsylvania was recognized as being unique in its reliance on the treatment and discharge option.

2.) The Committee undertook efforts to reinstate road spreading
   a. The desire for road spreading by municipalities was verified.
   b. The need for road spreading by selected conventional operators was verified.
   c. Pre-treatment of produced water prior to spreading was evaluated.
      i. In cooperation with the Committee Penn State University drafted a proposal to study the feasibility of a batch treatment process to remove hydrocarbons and radium from water prior to spreading. The viability of this proposal is under review by the Committee.

Committee Work Still underway:

1.) GCI out of Michigan is currently treating and discharging produced water to the Titusville Sewer Treatment Plant. Work continues to develop and add desalinization to the treatment process.

2.) Arana, a company from Texas, is now treating and discharging waste water to the Bradford POTW. Initial results are very favorable. Work continues to develop and add desalinization to the treatment process.

3.) Both companies are working on equipment to separate the rare earth elements and salt compounds that are in the production water and develop markets for the sale of these products.

4.) Now that these two plants are successfully operating, it is anticipated that both GCI and Arana will develop similar plants in other parts of the producing regions and thereby reduce trucking costs.

5.) Continue to encourage the U.S. EPA to extend the exemption so pre-treatment and discharges to POTWs remains a viable option in PA.

6.) Two sub-committees were formed to continue and expand CDAC’s efforts to have road spreading reinstated in PA. The short-term goal is to have road spreading reinstated by the summer of 2019. The long-term goal to work with DEP to develop an authorization procedure.

Summary:
Reliable and economically feasible waste water disposal options remains a key issue for the conventional oil and gas operators in Pennsylvania.

- Unlike most producing states, underground injections wells remain a minor component of the disposal options in PA.
- Treatment and discharge, which is the primary method for waste fluid disposal in PA, is under ever increasing regulator pressure and discharge limits.
- Road spreading of produced water on dirt and gravel roads was abruptly curtailed in 2018.
- Low commodity prices greatly hamper the conventional industry from developing or adjusting to new disposal options.

The Produced Water Committee is working with two new facilities that are now treating water and discharging produced water to POTWs and will encourage these operations to expand their presence in PA and at the same time encourage the U.S. EPA to maintain the exception that allows this practice.
The Committee continues to work with private investors to develop and operate treatment facilities that reduce TDS loads through economical desalination or salt removal. The development of markets for recovered materials to offset treatment costs is a key element of this goal. The reinstatement of the practice of road spreading of brine on dirt and gravel roads will be a key goal for the committee in 2019.