



September 24, 2013
GDP 13-0017

Attention: Document Control Desk
Ms. Catherine Haney
Director, Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

**Paducah Gaseous Diffusion Plant (PGDP)
Docket No. 70-7001, Certificate No. GDP-1
Transmittal of Changes to USEC-01: Fundamental Nuclear Materials Control Plan,
Emergency Plan, and Gaseous Diffusion Plant Security Program**

Dear Ms. Haney:

In accordance with 10 CFR 76.91(o) and SAR 6.3.3.1, the United States Enrichment Corporation (USEC) hereby submits changes to the Fundamental Nuclear Materials Control Plan (FNMCP), the Emergency Plan, and the Gaseous Diffusion Plant Security Program (GDPSP) as enclosures 1, 2, and 3, respectively. These changes have been reviewed in accordance with 10 CFR 76 and have been determined to not require prior NRC approval. These changes were effective September 20, 2013. Revision bars are provided in the right-hand margin to identify changes.

Enclosures 1 and 3 contain certain trade secrets and commercial and financial information exempt from public disclosure pursuant to Section 1314 of the Atomic Energy Act of 1954 (AEA), as amended, and 10 CFR 2.390 and 9.17(a)(4). Enclosure 5 provides the USEC affidavit required by 10 CFR 2.390(b)(4).

Should you have any questions regarding this matter, please contact me at (301-564-3250). There are no new commitments contained in this submittal.

Sincerely,

Steven A. Toelle
Director, Regulatory Affairs

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Ms. Catherine Haney
September 24, 2013
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- Enclosures:
1. USEC-01, Application for United States Nuclear Regulatory Commission Certification, Paducah Gaseous Diffusion Plant, Fundamental Nuclear Materials Control Plan, Revision 140 (September 20, 2013) - Proprietary.
 2. USEC-01, Application for United States Nuclear Regulatory Commission Certification, Paducah Gaseous Diffusion Plant, Emergency Plan, Revision 140 (September 20, 2013).
 3. USEC-01, Application for United States Nuclear Regulatory Commission Certification, Paducah Gaseous Diffusion Plant Gaseous Diffusion Plant Security Program, Revision 140 (September 20, 2013) - Proprietary.
 4. Oath and Affirmation
 5. Affidavit

cc: J. Hickey, NRC Region II
R. DeVault (DOE)
J. Diaz-Valez, NRC Region II
O. Siurano-Perez, NRC Project Manager (2 copies)
NRC Senior Resident Inspector – PGDP (letter only)

Enclosure 2 to
GDP 13-0017

USEC-01
Application for the United States
Nuclear Regulatory Commission Certification
Paducah Gaseous Diffusion Plant
Emergency Plan
Revision 140 (September 20, 2013)

**APPLICATION FOR NUCLEAR REGULATORY COMMISSION CERTIFICATION
PADUCAH GASEOUS DIFFUSION PLANT (USEC-01)
EMERGENCY PLAN
REMOVAL/INSERTION INSTRUCTIONS
REVISION 140 – September 20, 2013**

Remove Pages

Insert Pages

VOLUME 3

Emergency Plan:
iii/iv; 1-1/1-2, 4-1/4-2, 4-3/4-4

Emergency Plan:
iii/iv; 1-1/1-2, 4-1/4-2, 4-3/4-4

**EMERGENCY PLAN
LIST OF EFFECTIVE PAGES**

<u>Pages</u>	<u>Revision</u>	<u>Pages</u>	<u>Revision</u>
iii	140	2-4	123
iv	138	2-5	106
v	123	2-6	123
vi	135		
vii	8	3-1	46
viii	51	3-2	137
ix	51	3-3	8
x	138	3-4	8
xi	51	3-5	60
xii	2	3-6	1
1-1	140	4-1	137
1-2	81	4-2	140
1-3	123	4-3	140
1-3a	138	4-4	103
1-3b	123	4-5	51
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1-5	138	4-7	95
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1-8	119	4-10	1
1-9	26	4-11	21
1-10	26	4-12	3
1-11	26		
1-12	1	5-1	103
1-13	1	5-2	8
1-14	1	5-3	8
1-15	111	5-4	2
1-16	1	5-5	2
1-17	111	5-6	112
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1-18a	111	5-8	21
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1-19	2	5-10	44
1-20	1	5-11	44
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1-22	1	5-13	8
1-23	14	5-14	1
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2-1	112	6-1	51
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EMERGENCY PLAN - LIST OF EFFECTIVE PAGES (Continued)

<u>Pages</u>	<u>Revision</u>	<u>Pages</u>	<u>Revision</u>
6-4	114	A-1	51
6-5	103	A-2	1
6-6	137		
6-7	112	B-1	138
6-8	1	B-2	1
7-1	114	C-1	138
7-2	96	C-2	1
7-3	135		
7-4	114	D-1	103
7-5	95	D-2	51
7-6	138	D-3	137
		D-4	44
8-1	1		
8-2	1	E-1	24
		E-2	24
9-1	44		
9-2	135		
10-1	103		
10-2	1		

1. FACILITY DESCRIPTION

USEC leases portions of Paducah DOE reservation from the Department of Energy (DOE) and conducts uranium enrichment activities at the plant. These uranium enrichment activities are regulated by the NRC. DOE and DOE contractors also conduct activities and operate other facilities at the site, which are not regulated by the NRC.

1.1 DESCRIPTION OF NRC-REGULATED ACTIVITIES

The PGDP enrichment operations have been shut down. A description of the condition of the enrichment facilities equipment and the activities associated with those facilities is provided in SAR Section 3.3. UF₆ cylinder transfer/consolidation operations in the feed, withdrawal, and toll transfer and sampling facilities may continue for a short time after the enrichment cascade facilities are shut down. A description of the UF₆ Handling and Storage equipment that will support UF₆ cylinder transfer/consolidation operations is provided in SAR Sections 3.2, 3.4, 3.5, 3.6 and 3.7. Following the completion of UF₆ cylinder transfer/consolidation operations, UF₆ operations at PGDP will be limited to solid UF₆ cylinder movement and shipping. In addition, the C-310 purge cascade may continue to run to support potential future DOE operations. PGDP support infrastructure including maintenance facilities, laboratory facilities, chemical facilities, plant utilities, waste management, communications/alarms, and administrative facilities (as described in SAR Sections 3.8, 3.9, 3.10, 3.11, 3.12, 3.13, 3.14 and 3.15) will be reduced to the minimum necessary to support the needs of the plant. The remainder of this section provides a description of plant operations certified at the time of the shutdown of uranium enrichment operations at PGDP.

The primary mission of the plant is the enrichment of uranium with the isotope necessary to produce fuel for nuclear reactors (²³⁵U) using the gaseous diffusion process. A basic summary of this process follows.

Uranium hexafluoride is received from the conversion plant operated by Honeywell Corporation in Metropolis, Illinois, and other conversion facilities. The material is shipped to PGDP by truck and rail in cylinders containing 10 or 14 tons of UF₆ in accordance with Department of Transportation (DOT) regulations.

When UF₆ is received, it is assayed and weighed in the toll cylinder facility and stored. When needed, the assayed cylinder is moved to a feed facility, heated, and evacuated to the gaseous diffusion enrichment process.

Uranium hexafluoride is a white crystalline solid at ambient pressures and temperature and a gas at process conditions. The enrichment method increases the concentration of ²³⁵U by the physical process of diffusion. The UF₆ gas is not physically altered nor are its chemical properties changed.

The gaseous diffusion enrichment process employs a series of compressors and converters to enrich UF₆ in ²³⁵U. The fundamental building block of the process consists of a compressor, a converter, and a motor that form a stage. Stages are grouped together to form cells. The cells are then interconnected to provide what is known as a cascade. The compressors, which are driven by electric motors, are used to circulate the process gas and maintain flow through the cascade. The converters contain porous tubes and barriers through which the process gas is diffused. In each converter, a portion of the process gas diffuses through the barrier and is fed to the next higher stage with the undiffused gas being recycled to the next lower stage. The diffused stream is slightly enriched in the 235 isotope while the undiffused portion is slightly depleted in the 235 isotope to the same degree. Each stage also contains a gas cooler to remove the heat of compression from the process gas and a control valve for process control. The process is repeated through numerous cells until the desired enrichment level is reached.

Upon completion of the enrichment process, the enriched portion of the process stream is extracted in the product withdrawal facility and placed in 2.5-ton, 10-ton or 14-ton cylinders. 10-ton and 14-ton cylinders that are ≥ 1.0 wt % ²³⁵U are transferred to other cylinders prior to shipping to a customer. Any of these cylinders may be stored on site for future refeed to the cascade.

The depleted portion of the process stream is extracted in the tails withdrawal facility in 10- or 14-ton cylinders. The depleted uranium cylinders are moved to the cylinder storage yards located within the fence of PGDP, where they are currently being stored.

PGDP is designed to operate at a capacity of 11.3 million separative work unit (SWU) annually at its rated power level of 3,040 MW.

Source material, special nuclear material (SNM), and byproduct material are primarily handled in the buildings and storage yards listed in Table 1-1 and 1-2, respectively. The possession limits for source material, byproduct material, and SNM are shown in Table 1-3 of the Safety Analysis Report.

Uranium hexafluoride (UF_6) is a radioactive, poisonous material, which is found at PGDP as a gas, liquid and solid. Additionally, UF_6 reacts with water to form hydrogen fluoride (HF) and uranyl fluoride (UO_2F_2). UF_6 and UO_2F_2 are chemical toxicological hazards due to the heavy metal properties of uranium. The organs primarily affected are the kidneys. HF is an acid and may cause effects from irritation of skin, eyes, mucous membranes, and lungs to chemical burns causing deep tissue destruction. The radiotoxicological effects of uranium at the assays encountered at PGDP are not significant when compared to the chemical toxicological effects.

Numerous substances associated with the enrichment process could pose hazards if they were released to the environment. Only a few of these substances are highly toxic and present in large quantities at the plant. Based upon the hazards and consequence analyses that have been conducted, USEC has concluded that any nonradiological hazardous release would most likely involve one or more of the following:

- Chlorine trifluoride (ClF_3) is a poisonous gas, oxidizer, and corrosive. Additionally, ClF_3 reacts with water to form hydrogen fluoride and chlorine. ClF_3 is used as a drying agent in the cascade and is purchased and delivered in 160-lb cylinders. Cylinders are stored in the C-745-B cylinder yard and are transferred as needed to the C-350 drying agent storage building. The ClF_3 is vaporized into the C-350 ClF_3 storage drum, which is used for the controlled flow of ClF_3 to the distribution piping. This permits the controlled flow of ClF_3 to the C-310 building and to the C-331 and C-335 buildings' metering station for cell treatment on an as-needed basis. The inventories are controlled so that less than 1,000 lbs of ClF_3 are available for release from a single credible accident.
- Nitric acid (HNO_3) is a volatile, corrosive liquid. HNO_3 up to 70% concentration is delivered by truck and is stored in a 11,000 gal tank located outside the southwest corner of building C-400. Prior to use, the acid is transferred to and stored in a 500-gal day tank inside the building. HNO_3 is used primarily in a solution with water to decontaminate uranium-contaminated metal surfaces. It is also used for other miscellaneous chemical operations. The maximum inventory of HNO_3 at PGDP is limited by the capacity of the storage tanks.
- Hydrochloric acid (HCl) is a volatile, corrosive liquid. HCl is delivered by truck and is stored in a 17,000 gallon, two-section tank each containing 8,500 gallons, inside building C-400. Prior to use, the acid is diluted to less than 30% to form a "pickling" solution to be used as part of the cleaning process after degreasing.

4. RESPONSIBILITIES

USEC is responsible for overall direction and control of NRC-regulated activities at PGDP. USEC is also required to provide site-wide emergency response services to DOE pursuant to Appendix F of the Lease Agreement.

4.1 NORMAL FACILITY ORGANIZATION

While the Vice President, Enrichment Operations is ultimately responsible for the safe operation of the plant, the General Manager is responsible for the day-to-day management and operation of the plant, including the program of emergency response services. An organizational chart showing the functional levels and reporting responsibilities is provided in the Safety Analysis Report, Section 6.1. The administrative and technical support personnel staffing the plant organization are normally on-site daily, Monday through Friday, holidays excluded. Plant operational personnel are on duty 24 hours per day. Descriptions of the key managers at the plant and their responsibilities are provided below.

4.1.1 General Manager

The General Manager has direct responsibility for operation of the plant in a safe, reliable, and efficient manner. The General Manager is responsible for emergency management and is authorized to declare an emergency and to initiate the appropriate response.

4.1.2 Plant Manager

The Plant Manager provides assistance and support to the General Manager in providing for safe operation of the plant and is assigned specific areas of oversight for day-to-day production operations, and maintenance.

4.1.3 Operations Manager

The Operations Manager is responsible for the operations of the enrichment cascade. This includes such activities as ensuring the correct and safe operations of the plant utility and chemical services, UF₆ processes, proper handling of UF₆, and the periodic testing of equipment to ensure safe and efficient operation.

4.1.4 Section Deleted

4.1.5 Maintenance Manager

The Maintenance Manager is responsible for providing planning and safe and reliable performance of preventive, predictive, and corrective maintenance and support services on plant facilities and equipment, and for maintenance work scheduling.

4.1.6 Security Manager

The Security Manager is responsible plant police services and security. During emergencies, the Incident Commander directs the Security Organization as appropriate. The General Manager and delegated positions have stop work authority on security operations.

4.1.7 Section Deleted

4.1.8 Engineering Manager

The Engineering Manager is responsible for engineering activities in support of operations including design, fabrication, and construction of plant modifications or additions; the configuration management program. Responsibilities also include project management, construction, and coordination of large project plant modifications or additions.

4.1.9 Environmental, Safety and Health Manager

The Environmental, Safety and Health (ES&H) Manager is responsible for the environmental, industrial safety and hygiene programs, emergency management, waste management, and medical services at the facility. This includes activities to protect workers from chemical and physical hazards, and to maintain compliance with OSHA regulations.

The Environmental, Safety and Health Manager is also responsible for developing, maintaining, and updating the emergency plan, ensuring that the emergency management program is designed to comply with federal, state, and local regulations and for the establishment and oversight of the site environmental protection and monitoring programs.

The ES&H Manager is also responsible for establishing and implementing the radiation protection program.

4.1.10 Regulatory Affairs Manager

The Regulatory Affairs manager is responsible for the day-to-day interface with NRC representatives on matters of regulatory compliance. As delegated by the Director, Regulatory Affairs, the Regulatory Affairs Manager has responsibility for coordinating certification related and certificate renewal-related activities. The Regulatory Affairs Manager is also responsible for nuclear criticality safety, nuclear safety, and developing, maintaining, and updating the plant's corrective action and commitment management program, including administration of the problem reporting system. The Regulatory Affairs Manager is also responsible for the training, procedures, and records management and document control (RMDC) programs.

4.1.11 Shift Operations Manager

The Shift Operations Manager oversees the activities of the PSSs and fire services, and has the responsibility and authority to make decisions to assure safe operation of the plant.

4.1.12 Nuclear Safety and Quality Manager

The Nuclear Safety and Quality Manager is responsible for implementing and directing independent assessments, quality control, nuclear material control and accountability, and nuclear safety assurance.

4.1.13 Section Deleted

4.1.14 On-Duty PSS

As the senior manager on shift, the on-duty PSS represents the General Manager and managers and has the authority and responsibility to make decisions as necessary to ensure safe operation, including stopping work and placing the plant in a safe condition.

The on-duty PSS is responsible for making proper notification in regard to abnormal plant conditions, determining the severity of the event, declaring an emergency, and initiating appropriate response. The on-duty PSS may respond to an incident scene as the on-scene incident commander or dispatch other qualified individual in this capacity. The on-duty PSS is the crisis manager until relieved by a member of management designated in the emergency line of executive succession.

4.1.15 Section deleted.

4.1.16 GDP Procurement and Materials Manager

The GDP Procurement and Materials Manager is responsible for managing the projects, programs, and the activities related to packaging and transportation, material control, stores, shipping and receiving, and property disposition.

4.1.17 Nuclear Criticality Safety Manager

The Nuclear Criticality Safety Manager is responsible for implementing the nuclear criticality safety program. This position reports to the Regulatory Affairs Manager.

4.1.18 Production Support & Product Scheduling Manager

The Production Support & Product Scheduling Manager is responsible for establishing and implementing the laboratory operations program.

4.2 ON-SITE EMERGENCY RESPONSE ORGANIZATION

The Emergency Response Organization (ERO) is responsible for taking immediate mitigative and corrective actions to minimize the consequences of an incident to workers, public health and safety, and the environment. The ERO is staffed with trained personnel who respond to events and are required to participate in formal training, drills, and exercises. The incident type and severity dictate the level of ERO activation.

The ERO has the following specific functions and responsibilities, depending on the incident and level of response needed to mitigate the problem: event categorization, determination of emergency class, notification, protective action recommendations, management and decision making, control of on-site emergency activities, consequence assessment, protective actions, medical support, public information, activation and coordination of on-site response resources, security, communications, administrative support, and coordination and liaison with off-site support and response organizations.

The ERO is divided into functional groups as follows:

1. Plant Emergency Squad,
2. EOC cadre, and
3. Joint Public Information Center (JPIC).

Members of these groups are assigned to on-scene response locations and emergency response centers, such as the EOC. Emergency assignments correspond as closely as possible to daily duties. Primary and alternate personnel are assigned to the ERO positions. Assignments are updated periodically. Management ERO positions in each group provide oversight and final authority in the group's decision-making process.

4.2.1 Direction and Coordination

The initial ERO consists of the plant emergency squad with the PSS, or other qualified individual as incident commander (IC) at the scene. Upon classification of the emergency as an Alert or SAE, the PSS becomes the CM and maintains overall control of the plant during the emergency until relieved. When the EOC is operational, a manager designated in the emergency line of executive succession relieves the PSS as CM and the overall control of the emergency shifts from the PSS to the CM.

The PSS conducts transition and turnover of command and control authority and responsibility of the CM function in a formal manner by use of specially developed procedural checklists and, if possible, face-to-face briefings. A primary and alternates are identified for the CM.

The order of succession for the CM position is identified in an EPIP and includes the following:

1. PSS
2. General Manager
3. Plant Manager
4. Others as designated by the General Manager and trained and qualified as CM

Enclosure 4
GDP 13-0017

Oath and Affirmation

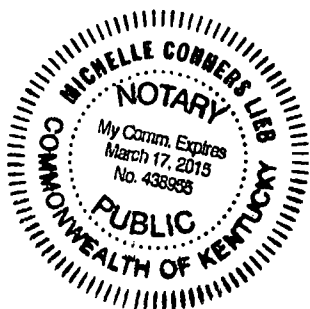
OATH AND AFFIRMATION

I, Steven A. Toelle, swear and affirm that I am the Director, Regulatory Affairs, of the United States Enrichment Corporation (USEC), that I am authorized by USEC to sign and file with the Nuclear Regulatory Commission changes to the USEC Application for United States Nuclear Regulatory Commission Certification for the Paducah Gaseous Diffusion Plant (USEC-01), as described in USEC Letter GDP 13-0017, that I am familiar with the contents thereof, and that the statements made and matters set forth therein are true and correct to the best of my knowledge, information, and belief.

S. A. Toelle
Steven A. Toelle

On this 24th day of September, 2013, the person signing above personally appeared before me, is known by me to be the person whose name is subscribed to within the instrument, and acknowledged that he executed the same for the purposes therein contained.

In witness hereof I hereunto set my hand and official seal.



Michelle Connors Lieb
Michelle Connors Lieb, Notary Public
Commonwealth of Kentucky, McCracken County
My commission expires March 17, 2015

Enclosure 5
GDP 13-0017

Affidavit

**AFFIDAVIT OF STEVEN A. TOELLE
SUPPORTING APPLICATION TO WITHHOLD FROM
PUBLIC DISCLOSURE CERTAIN PORTIONS OF
CHANGES TO USEC-01
APPLICATION FOR UNITED STATES
NUCLEAR REGULATORY COMMISSION CERTIFICATION
PADUCAH GASEOUS DIFFUSION PLANT**

I, Steven A. Toelle, Director, Regulatory Affairs, of the United States Enrichment Corporation (USEC), having been duly sworn, do hereby affirm and state:

1. I have been authorized by USEC to (a) review the information owned by USEC which is referenced herein relating to the Paducah Gaseous Diffusion Plant and which USEC seeks to have withheld from public disclosure pursuant to section 147 of the Atomic Energy Act (AEA), as amended, 42 U.S.C. § 2167, and 10 CFR 2.390(a)(3), 2.390(a)(4), 2.390(d)(1) and 9.17(a)(4), and (b) apply for the withholding of such information from public disclosure by the Nuclear Regulatory Commission (NRC) on behalf of USEC.

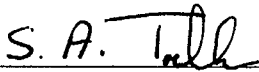
Fundamental Nuclear Materials Control Plan

2. Pursuant to 10 CFR 76.35(h), USEC has prepared a "Fundamental Nuclear Materials Control Plan (FNMCP), Paducah Gaseous Diffusion Plant" which describes the measures used by USEC at the Paducah plant to control and account for special nuclear material that USEC uses, possesses, or has access to. USEC is submitting changes to this plan to the NRC.
3. 10 CFR 2.390(d)(1) states that correspondence and reports to or from the NRC containing information concerning an applicant's material control and accounting program for special nuclear material not otherwise designated as Safeguards Information or classified as National Security Information or Restricted Data are deemed to be confidential commercial or financial information exempt from public disclosure. The FNMCP contains such information. Accordingly, USEC requests that the attached Revision 140 to the "Fundamental Nuclear Materials Control Plan (FNMCP)" be withheld from public disclosure pursuant to section 147 of the AEA, 42 U.S.C. § 2167, and 10 CFR 2.390(a)(3), 2.390(d)(1) and 9.17(a)(4).

Gaseous Diffusion Plant Security Program

4. Pursuant to 10 CFR 76.35(i), 10 CFR 76.35(j), and 10 CFR 76.35(k) USEC has prepared a "Gaseous Diffusion Plant Security Program (GDPSP)" which describes the measures used by USEC at the Paducah plant to a) protect off-site shipments of special nuclear material of low strategic significance; b) physically protect special nuclear material that the corporation uses, possesses, or has access to at fixed sites; and c) physically protect and control classified matter. USEC is submitting changes to this plan to the NRC.

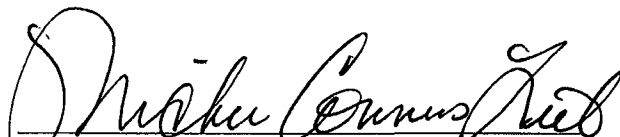
- 5 10 CFR 2.390(d)(1) states that correspondence and reports to or from the NRC containing information concerning an applicant's physical protection or material control and accounting program for special nuclear material not otherwise designated as Safeguards Information or classified as National Security Information or Restricted Data are deemed to be confidential commercial or financial information exempt from public disclosure. The GDPSP contains such information. Accordingly, USEC requests that the attached Revision 140 to the "Gaseous Diffusion Plant Security Program (GDPSP)" be withheld from public disclosure pursuant to section 147 of the AEA, 42 U.S.C. § 2167, and 10 CFR 2.390(a)(3), 2.390(d)(1) and 9.17(a)(4).
- 6 Steven A. Toelle, having been duly sworn, hereby confirms that I am the Director, Regulatory Affairs of USEC, that I am authorized on behalf of USEC to review the information attached hereto and to sign and file with the Nuclear Regulatory Commission this affidavit and the attachments hereto, and that the statements made and matters set forth herein are true and correct to the best of my knowledge, information, and belief.



Steven A. Toelle

On this 24th day of September 2013, the individual signing above personally appeared before me, is known by me to be the person whose name is subscribed to within the instrument, and acknowledged that he executed the same for the purposes therein contained.

In witness hereof I hereunto set my hand and official seal.



Michelle Conners Lieb, Notary Public
Commonwealth of Kentucky, McCracken County
My commission expires March 17, 2015

