

ATTACHMENT 1

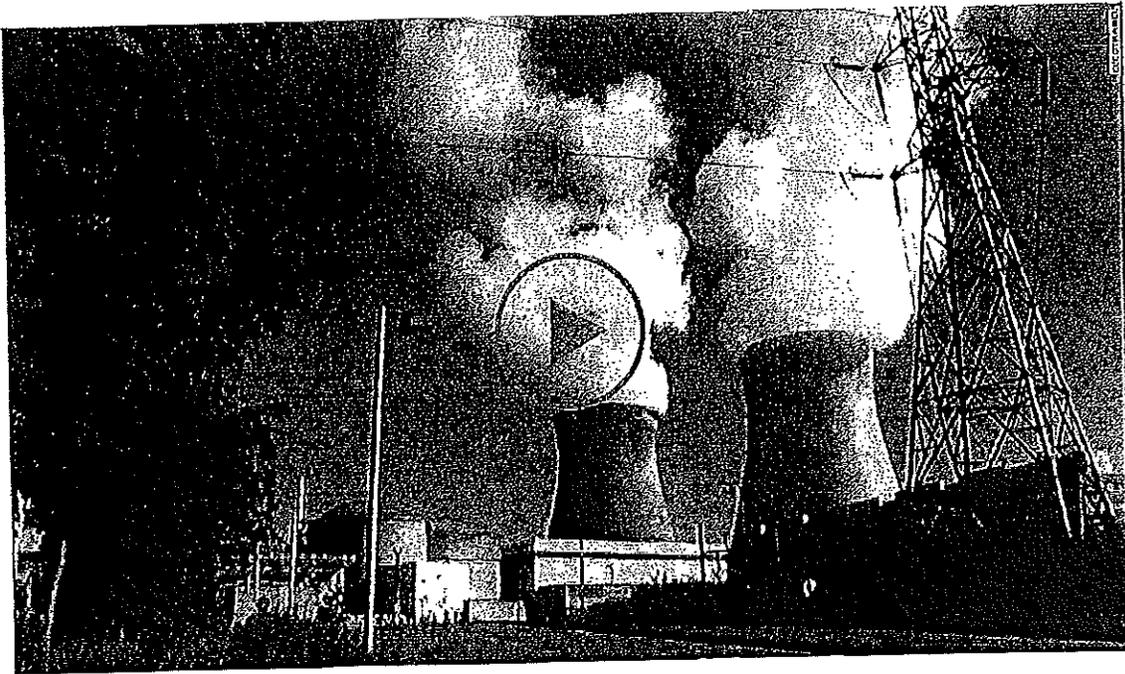
FOR

AFFIDAVIT OF LISA A. FORNEY, MEPC

Nuclear terrorist threat bigger than you think

By Joe Cirincione

Updated 5:53 PM ET, Fri April 1, 2016



Were Brussels terrorists trying to build 'dirty bomb'? 03:54

Story highlights

Joe Cirincione: I don't know a single nuclear expert who thinks threat of nuclear terrorism is shrinking

Editor's Note: Joe Cirincione is the president of Ploughshares Fund, a global security foundation. He is the author of "Nuclear Nightmares: Securing the World Before It Is Too Late," and "Bomb Scare: The History and Future of Nuclear Weapons." He serves on the secretary of state's International Security Advisory Board. The views expressed are his own.

Nations need to do more to reduce and better protect nuclear reactors and spent nuclear fuel

(CNN) — Nuclear policy experts can seem like Cassandra, constantly prophesizing apocalyptic futures. In case you haven't noticed, we don't live in a Mad Max world devastated by nuclear war. Terrorists have not blown up New York with a makeshift nuclear bomb. We haven't bankrupted

ourselves, despite the trillions of dollars spent on Cold War weapons.

Cassandra's curse, however, was not that she was wrong, but that no one believed her. I don't know a single nuclear expert who thinks that the threat of nuclear terrorism is shrinking. I don't know a single one who thinks that the actions taken by world leaders at this week's Nuclear Security Summit are enough. We are fearful. And you should be, too.



Joe Cirincione

Chills went down a lot of experts' spines last month when we saw the news that the Brussels bombers, the ISIS terrorists who blew up the airport and attacked the metro, were secretly videotaping a Belgian nuclear official. This official worked at a facility that had radiological material that terrorists could use for a "dirty bomb." We do not know if they were filming him or his family, if there was a kidnap plot in motion, or what their exact plans were. But this is not some Hollywood fantasy. This is real. A nuclear terrorist event may be closer than you think.

What are the risks? First, that terrorists could steal a complete nuclear weapon, like SPECTRE in the James Bond thriller, "Thunderball." This is hard, but

not impossible. The key risk is that the outside terrorists get insider help: For example, a radical Jihadist working at a Pakistan weapon storage site. Or the Belgian base just outside Brussels where we still stash a half-dozen nuclear weapons left over from Cold War deployments. Or the Incirlik air base in Turkey where we keep an estimated 50 weapons just 200 miles from the Syrian border.

Second, terrorists could steal the "stuff" of a bomb, highly enriched uranium or plutonium. They cannot make this themselves -- that requires huge, high-tech facilities that only nations can construct. But if they could get 50 or 100 pounds of uranium -- about the size of a bag of sugar -- they could construct a crude Hiroshima-style bomb. ISIS, with its money, territory and global networks, poses the greatest threat to do this that we have ever seen. Such a bomb brought by truck or ship or FedEx to an urban target could kill hundreds of thousands, destroy a city and put the world's economy and politics into shock.

Third, there is the possibility of a dirty bomb. Frankly, many of us are surprised this has not happened already. I spoke to Jon Stewart on his show 15 years ago about the danger. This is not a nuclear explosion unleashed by splitting atoms, but simply a conventional explosive, like dynamite, faced with radioactive material, like cesium or strontium. A 10-pound satchel of dynamite mixed with less than 2 ounces of cesium (about the size of a pencil eraser) could spew a radioactive cloud over tens of square blocks. No one would die, unless they were right next to the explosion. But the material would stick to the buildings. Inhaling just a speck would greatly increase your risk of getting cancer. You could go into the buildings, but no one would. There would be mass panic and evacuations, and the bomb would render a port, financial district, or government complex unusable and uninhabitable for years until scrubbed clean. Economic losses could be in the trillions.



Related Article: North Korea doesn't have an H-bomb (Opinion)

Fourth, terrorists could just attack a nuclear power reactor, fuel storage or other site to trigger a massive radioactive release that could contaminate hundreds or thousands of square miles, like Chernobyl or Fukushima. While nuclear reactors are hardened against outside attack, including by the intentional crash of a medium-sized jet plane, larger planes could destroy them. Or a series of suicide truck bombers. But it might not even take a physical explosion. This week, it was reported the United States and the United Kingdom are to simulate a cyberattack on a nuclear power plant.

Can we prevent these attacks? Yes, by eliminating, reducing and securing all supplies of nuclear materials so that terrorists would find it too difficult

to get them. And by reducing and better protecting nuclear reactors and spent nuclear fuel.

Are we doing enough? No. "The capabilities of some terrorist groups, particularly the Islamic State, have grown dramatically," says Harvard scholar and former Bush Administration official William Tobey, "In a net calculation, the risk of nuclear terrorism is higher than it was two years ago."

The United States spends about \$35 billion on nuclear weapons every year. This year, we will spend \$1.8 billion on all our efforts to stop the spread these weapons and stop nuclear terrorism. You don't have to be a nuclear expert to know something is out of whack here.

It is time we put our money where our threats are.

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ATTACHMENT 2

FOR

AFFIDAVIT OF LISA A. FORNEY, MEPC

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Radiation Protection and
Bureau of Land Recycling and Waste Management

DOCUMENT NUMBER: 250-3100-001

TITLE: Final Guidance Document on Radioactivity Monitoring at Solid Waste Processing and Disposal Facilities.

EFFECTIVE DATE: January 2, 2004

AUTHORITY: Solid Waste Management, Act of July 7, 1980, P.L., No. 97, as amended, 35 P.S. Sections 6018.101-6018.1003; Radiation Protection Act, Act of July 10, 1984, P.L. 688, No. 147, 35 P.S. Sections 7110.101-7131.1101; The Administrative Code of 1929, Section 1917-A, 71 P.S. Section 510-17; Solid Waste Regulations, 25 Pa. Code Chapters 273, 277, 279, 281, 283, 284, 288, 289, 293, 295 and 297; Radiological Health Regulations, 25 Pa. Code Chapters 215-240.

POLICY: To protect the environment and the public health, safety and welfare from the possible dangers of radioactive material that is delivered to solid waste processing and disposal facilities.

APPLICABILITY: This guidance document applies to all owners and operators of solid waste processing and disposal facilities that are required by regulation to monitor for radiation from incoming loads of waste, and to those facilities that choose to monitor even though not required. This guidance document also applies to all Department personnel and activities involved with waste facility permitting, operations and enforcement, radiation protection, grants, monitoring, administration and emergency response.

DISCLAIMER: The policies and procedures outlined in this guidance are intended to supplement existing requirements. Nothing in the policies or procedures shall affect regulatory requirements.

The policies and procedures herein are not an adjudication or a regulation. There is no intent on the part of DEP to give the rules in these policies that weight or deference. This document establishes the framework within which DEP will exercise its administrative discretion in the future. DEP reserves the discretion to deviate from this policy statement if circumstances warrant.

PAGE LENGTH: 38 Pages

LOCATION: Volume 5, Tab 7

DEFINITIONS: See attached.

GUIDANCE DOCUMENT ON RADIOACTIVITY MONITORING AT SOLID
WASTE PROCESSING AND DISPOSAL FACILITIES

TABLE OF CONTENTS

Definitions

Technical Guidance

- Background
- General Considerations
- Action Plans
- Dose Limits for Public and Workers
- Detection of Radiation

Identification of RAM Found in the Waste Stream

- Landfill or Disposal Impoundment
- Other Facilities
- Records and Reports
- Monitoring and Equipment

APPENDICES:

- A. Notification of Incidents of RAM in Solid Waste and /or Requests for DOT Exemption Form
- B. Activities and Dose Rates for Authorizing Patient Release
- C. Guidelines for Radiological Monitoring Equipment
- D. Guidelines for Action Plans for Detection and Handling of Radioactivity at Solid Waste Facilities
- E. Background Information on Radioactive Material in Solid Waste
- F. Radiation Protection Fundamentals

DEFINITIONS

Absorbed Dose:	Measure of energy absorbed by material interacting with radiation. The unit in the older conventional system is the rad, which is equal to the energy of 100 ergs per gram of irradiated material. In the System International (SI), the unit for absorbed dose is the gray (Gy), which is equal to 100 rads.
Activity:	Rate of decay for radioactive material. The older conventional unit is the curie (Ci). The System International (SI) unit is becquerel (Bq), where $1\text{Ci} = 3.7 \times 10^{10}\text{Bq}$.
Byproduct Material:	(1) Radioactive material, except special nuclear material, yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material and (2) the tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from uranium or thorium solution extraction processes. Underground ore bodies depleted by these solution extraction operations do not constitute "byproduct material" within this definition. (10 CFR §20.1003)
Decay:	Transformation of atoms of a radioactive element to atoms of another by emission of alpha or beta particles (positive or negative), or gamma rays from its nucleus. The resulting decay product may be radioactive or stable.
Department or DEP:	The Pennsylvania Department of Environmental Protection.
Dose Equivalent:	The dose of an ionizing radiation that will cause the same biological effect as one rad of x rays or gamma-rays. In the older conventional system, the unit is the rem. In the SI system, the unit is the sievert (Sv), $1\text{Sv} = 100\text{rem}$. Dose equivalent is calculated by multiplying absorbed dose (rad, Gy) by a quality factor (QF) that accounts for the effectiveness of the radiation, relative to gamma or x rays, in causing a biological effect, i.e., $\text{rem} = \text{rad} \times \text{QF}$; $\text{Sv} = \text{Gy} \times \text{QF}$. (Note: For this guidance, and x ray or gamma radiation, $\text{rem} = \text{rad} = \text{R}$.)
DOT:	The U.S. Department of Transportation.
DOE:	The U.S. Department of Energy.
EPA:	The U.S. Environmental Protection Agency. (Note: According to the revised Federal Radiation Emergency Response Plan (FRERP), EPA is responsible for providing assistance to states in managing incidents involving radioactive material of unknown origin that is found outside of Nuclear Regulatory Commission (NRC) licensed facilities unless the radioactive material is clearly associated with a NRC licensee, in which

case the NRC assumes responsibility for assistance. In general, federal agencies provide assistance at the request of the state.)

Exposure Rate:	An older measurement quantity of intensity for x ray or gamma radiation causing ionization of air. It is still in practical use in the U.S.A.; measured in roentgen (R) or microroentgen (μ R) per unit time, usually an hour, as in Rh^{-1} or μRhr^{-1} . $1 R = 2.58 E-4 C/kg$ of air.
Half-life:	The time required for half the atoms of a quantity of a radioactive material to decay or become transformed to another nuclide.
Isotope:	A chemical element with the same atomic number (i.e., number of protons), but different atomic mass.
Multichanne Analyzer (MCA):	An electronic instrument which, when coupled with an appropriate detector, can determine the energy associated with various radiations and thereby identify the radioactive material emitting the radiation.
NARM:	Naturally occurring or accelerator-produced radioactive material. The term does not include byproduct, source or special nuclear material.
NORM:	Naturally occurring radioactive material is a radioisotope that is radioactive in its natural physical state, not man-made, but does not include source or special nuclear material.
NRC:	The U.S. Nuclear Regulatory Commission, which is the federal agency responsible for the regulation of power and research reactors, and radioactive materials produced in nuclear reactors, and certain quantities of uranium and thorium.
Radioactive Material(RAM):	A material – solid, liquid or gas - which emits radiation spontaneously.
Radiation:	The ionizing particles (alpha, beta, others) or photons (x or gamma ray) emitted by radioactive materials in the process of decay or nuclear transformation.
Radioisotope:	A radioactive isotope of an element.
Source Material:	(1) Uranium or thorium or any combination of uranium and thorium in any physical or chemical form; or (2) ores which contain, by weight, 0.05 percent or more, of uranium, thorium, or any combination of uranium and thorium. Source material does not include special nuclear material. (10 CFR § 20.1003)
Special Nuclear or Material:	(1) Plutonium, uranium-233, uranium enriched in the isotope 233, in the isotope 235, and in any other material that the Nuclear Regulatory Commission, pursuant to the provisions of Section 51 of the Atomic

Energy Act of 1954 determines to be special nuclear material, but does not include source material; or (2) any material artificially enriched by any of the foregoing but does not include source material. The term "Department" shall be substituted for the term "Commission" when the Department assumes Agreement State status from the Nuclear Regulatory Commission. (10 CFR §20.1003)

TEDE:

Total effective dose equivalent. Means the sum of the deep dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures). (10 CFR § 20.1003.)

TENORM:

Technologically enhanced naturally occurring radioactive materials. It is naturally occurring radioactive material not specifically subject to regulation under the laws of the Commonwealth or Atomic Energy Act (Public Law 83-703, 68 Stat. 921, 42 U.S.C. §2011 et seq.), but whose radionuclide concentrations or potential for human exposure have been increased above levels encountered in the undisturbed natural environment by human activities.

**Transuranic (TRU)
Radioactive
Material:**

The term "transuranic radioactive material" means material contaminated with elements that have an atomic number greater than 92, including neptunium, plutonium, americium and curium. TRU waste disposal is strictly regulated by the NRC and DOE.

TECHNICAL GUIDANCE

Background

The Department has the responsibility of protecting the health and safety of the citizens of the Commonwealth and the environment from toxic and hazardous materials in the environment. This includes most sources of radiation. With increasing frequency, radioactive materials have been detected in the municipal waste stream by monitors installed at waste processing and disposal facilities. Radioactive material (RAM) can also appear in the residual waste stream. Sometimes the radiation comes from naturally occurring radioactive material (NORM), but most often it comes from man-made radioactive materials. Man-made radioisotopes are regulated by the U.S. Nuclear Regulatory Commission (NRC) and/or the individual states. Accelerator-produced radioactive materials are regulated by the Commonwealth. Naturally occurring radioactive materials (NORM) are not regulated in Pennsylvania unless resulting radiation doses exceed the limits set forth in Title 25, Chapter 219 of the Pennsylvania Code. However, in the case of radium-226, the Commonwealth can regulate individual discrete sources above 0.1 microcurie (μCi), as set forth in Chapter 217. Thus, one can have RAM that is regulated (through specific or general license), unregulated, deregulated, or exempted from regulation by a variety of federal and state regulatory authorities, and yet the material may cause a solid waste facility radiation monitor to alarm.

Almost everything in the world contains small amounts of radioactive elements, which in turn emit radiation. Most radiation found in the natural environment comes from NORM and cosmic radiation from space, with minor amounts from past above ground testing of nuclear weapons, the nuclear fuel cycle, and perhaps effluents from medical and industrial uses of radioisotopes. Most of the alarm events with radiation monitoring of the municipal waste stream in Pennsylvania have been from short-lived isotopes often used in medical procedures. However, a number of very dangerous RAM sources have been recovered in recent years (e.g., 4.2 Ci Ir-192 and 20 mCi radium-beryllium neutron sources). It is possible that the medical isotopes are getting into the waste stream directly from the medical facilities via contaminated items getting into general trash by mistake. Alternately, the contaminated items are discarded in municipal waste from homes of patients who have had nuclear medicine procedures and been discharged from the treating facility. Other credible routes to the waste stream include contaminated items being discarded in regular trash containers by mistake from clinical or research laboratories, industrial facilities, misplaced encapsulated RAM sources, and construction, residual or industrial waste containing NORM, TENORM or other types of radioactive material.

State and federal regulations require that those who are licensed to handle radioactive materials will maintain strict controls relative to the use and disposal of the material, and will take appropriate actions to prevent unauthorized releases of radioactive materials in solid waste. Nonetheless, for some radioactive materials licensed by NRC or state regulations, once radioisotopes have been administered to patients, and are not likely to cause a dose to an individual above the proscribed public dose limit, the RAM is no longer regulated and patients can be discharged from the treating facilities. The potential amount of radioisotope in a patient's body that may be released from a medical facility is noted in NRC Regulatory Guide 8.39.¹ It should be noted, even small amounts of radioisotopes used for diagnostic tests or radioactivity retained on items touched by patients may emit enough radiation to set off a facility radiation monitoring alarm. Licensees are encouraged to investigate ways of effectively monitoring institutional waste streams coming from facilities using radioactive material before the waste leaves the

¹Regulatory Guide 8.39, Release of Patients Administered Radioactive Materials. U.S. Nuclear Regulatory Commission, Washington, DC April 1997. A copy of the relevant table from Regulatory Guide 8.39 is attached to this document as Exhibit B.

facility. The NRC has recently issued guidance to RAM licensees for the "Management of Wastes Contaminated with Radioactive Materials" in Information Notice 99-33.

Additionally, there are a number of consumer and industrial items containing RAM in general use that are distributed under a regulatory "exemption" or "general license;" that is, the fabricator or distributor must be licensed but the individual owner/user does not have a "specific license." Examples of exempt RAM include some types of smoke detectors, self-luminous watches or clocks, and many others. Some of these consumer items, like smoke detectors are assumed by the NRC to be discarded in municipal waste during their normal life cycle, however return to the manufacturer is recommended. Other RAM is supposed to be returned to the manufacturer for proper recycle or low-level radioactive waste disposal (e.g., self-luminous tritium EXIT signs). For the more hazardous higher activity sources, the NRC and the Department are presently developing registration requirements to inventory generally licensed (GL) devices used in industry and other areas.

It is interesting to note the first time an alarm went off at one large landfill in Pennsylvania, the cause was a load of sludge containing TENORM (specifically radium- 226) from a facility that treated oil and gas well brine. Similarly, most rocks, bricks, gypsum wall board, slag from metal processing, waste from coal ash or coke processing, and similar residuals contain some natural radioactivity. Depending on their origin, these materials may emit enough radiation to set off the radiation alarms at solid waste facilities. These are all examples of NORM or TENORM.

Given the above examples of RAM that may set off waste facility radiation alarms, materials that are regulated, deregulated, exempt or unregulated, there are no current standards for radiation monitor alarm set points, and the potential for serious impact on human health and the environment - the DEP Bureaus of Radiation Protection and Land Recycling and Waste Management have recommended to the Department's Solid Waste Advisory Committee and the Environmental Quality Board, that the Department promulgate regulations requiring monitoring for radiation and radioactive materials at the following types of facilities:

- Municipal waste landfills. (25 Pa. Code Ch. 273)
- Construction/demolition waste landfills. (25 Pa. Code Ch. 277)
- Municipal Waste transfer facilities. (25 Pa. Code Ch. 279)
- Commercial municipal waste composting facilities that will receive sewage sludge or unseparated municipal waste, or both. (25 Pa. Code Ch. 28)
- Resource recovery and other municipal waste processing facilities. (25 Pa. Code Ch. 283)
- Commercial infectious or chemotherapeutic waste processing facilities. (25 Pa. Code Ch. 284)
- Noncaptive residual waste landfills. (25 Pa. Code Ch. 288)
- Noncaptive residual waste disposal impoundments. (25 Pa. Code Ch. 289)
- Noncaptive residual waste transfer facilities. (25 Pa. Code Ch. 293)
- Noncaptive residual waste composting facilities. (25 Pa. Code Ch. 295)
- Noncaptive residual waste incinerators and other noncaptive residual waste processing facilities. (25 Pa Code Ch. 297)

Operators of these facilities must comply with the new regulatory requirements as they are adopted and phased in. Requirements may be implemented by following the recommendations of this guidance document. Briefly, the facilities will have to be equipped with suitable gamma radiation detection devices to monitor incoming loads of waste for radioactive materials in the waste, and will be required to have an appropriate Action Plan that is approved by the Department. These, and the other applicable requirements and recommendations, are discussed herein. It is the Department's belief that these

regulations and guidance will be a model for all solid waste facility operators that monitor for radioactive material in incoming waste loads. For Pennsylvania solid waste facilities not required to monitor, but wish to do so as a best management practice, this guidance document should be followed.

General Considerations

Detecting radiation and dealing with radioactive materials in the waste stream is a multiple phase process, including:

- Monitoring and detection of gamma radiation,
- Personnel Training,
- Awareness of items that may contain RAM,
- Initial response to the detection of RAM,
- Notifications - within the company, to DEP, and to others as necessary,
- Characterization,
- Disposition, and
- Record keeping.

The details of these phases may vary somewhat with the type of facility; but in most respects they are similar, except for disposition of the radioactive material. In some cases the facility may have the option of onsite processing or disposal with Department concurrence or pre-approval. Alternately, the waste load may be rejected. However, once RAM has been identified in the waste, it may not be transported on public roads without an evaluation for compliance with DOT regulations. The Department has the authority to exempt carriers from DOT regulations with the scenario of RAM in waste if certain conditions are satisfied.

Action Plans

The Department's regulations require specified facilities to have an approved Action Plan to give direction to operating staff and facility users regarding procedures for detecting and dealing with radioactive material in the waste stream. Action Plans will be part of the solid waste facility permit by modification, and must be approved by the Department. Guidance for preparation of Action Plans and their content is described below, and is also provided in Appendix D. As part of the submission of a proposed Action Plan, the Department may approve the processing and/or disposal of short lived RAM (e.g., I-131, Tc-99m, Tl-201, etc.) from a patient having undergone a medical procedure, small quantities of TENORM, and consumer products containing RAM. This will require providing appropriate justification and/or pathway analysis for modeling potential public and facility staff doses.

Dose Limits for Public and Workers

The public and occupational annual dose limits that will be utilized by the Department in evaluating proposed Action Plans are as follows:

Facility staff -	5,000 mrem	(considered as "occupationally" exposed)
Facility staff -	100 mrem	(if considered member of the "public")
Vehicle driver -	100 mrem	(considered member of the public)
General Public -	4 mrem	(for the drinking water pathway)
General Public -	10 mrem	(for the air pathway)
General Public -	25 mrem	(all pathways combined).

The above public radiation dose limits are all TEDE, where an external deep dose and internal committed dose is summed. It is important to emphasize that all public and facility staff exposure to radiation should be maintained as-low-as-reasonably-achievable (ALARA). As stated above, some facility staff may be considered members of the public, if it is unlikely they will exceed the 100 mrem per year dose limit. However, certain personnel may be considered occupationally exposed workers if higher exposures are anticipated (e.g., the individual that may be performing vehicle surveys). The Action Plan should include consideration of relevant requirements outlined in the Department's Standards for Protection Against Radiation (25 Pa Code Ch. 219) and Notices, Instructions and Reports to Workers (25 Pa Code Ch. 220) if personnel are to be considered occupationally exposed.

In all reviews of proposed Action Plans, the Department will perform evaluations to ensure solid waste processing or disposal does not endanger the environment, facility staff and public health and safety. Therefore proposed Action Plans should describe the potential exposure pathways for members of the general public, and how these expected doses were modeled. For certain solid waste facilities where processing solid waste may release RAM to the environment, the Department recommends the use of basic and conservative regulatory computer codes for such pathway analysis and dose modeling, e.g., the EPA's CAP88 or DOE/NRC's RESRAD codes. These codes and support documentation can be downloaded from various internet web sites. However, valid manual calculations using dispersion equations and published dose conversions factors are equally acceptable to the Department.

Detection of Radiation

The Department's revised solid waste regulations require radiation monitoring and response at the solid waste facilities specified above. Additionally, the regulations state that the radiation detector elements shall be as close as practical to the waste load, and in an appropriate geometry to monitor the waste. The Action Plan should require notification to the Department for conditions specified in the regulations (i.e., radiological conditions noted below in Action Level Two), the detection of prohibited RAM, or the case when a waste load is rejected and a DOT Exemption Form must be issued. Action Plans should address the two basic scenarios, or Action Levels, when radiation is detected from a truck or waste container:

1. Action Level One: A radiation monitor alarm at the facility indicating the potential presence of radioactive material in a waste load.

(Note: The regulations require a gamma exposure rate from a cesium-137 source, at a level no higher than 10 $\mu\text{R h}^{-1}$ above the average local background, at any detector element, shall cause an alarm at the facility. Instrument background shall be kept below 10 $\mu\text{R h}^{-1}$ using shielding if needed, and the system shall be set to detect gamma ray energies of 50 kiloelectron volts and higher.)

2. Action Level Two: Radiation dose rates of 20 $\mu\text{Sv h}^{-1}$ (2 mrem h^{-1}) or greater in the cab of the waste transport vehicle, 500 $\mu\text{Sv h}^{-1}$ (50 mrem h^{-1}) or greater from any other surface, or the detection of contamination on the outside of the vehicle shall require immediate notification of the Department, and isolation of the vehicle.

Measurements should be made in accordance with guidance provided in Appendix D

**IDENTIFICATION AND DISPOSITION OF RADIOACTIVE MATERIAL
FOUND IN THE WASTE STREAM**

I. Landfill or Disposal Impoundment

A. RAM from Patients Having Undergone a Nuclear Medicine Procedure

If the gamma spectroscopy or other measurement indicates the radiation is from a radioisotope with a half-life of 65 days or less, the DEP Area Health Physicist may authorize the contents of the waste load to be processed and/or disposed of immediately. (See Appendix A for telephone numbers during normal and non-business hours.) This is provided there is a high likelihood, through radioisotope identification, the RAM is from a patient having undergone a medical procedure, and the disposal does not endanger the health or safety of the facility staff, the public or the environment. Alternately, as noted above, the facility may provide justification (e.g., considering the facility's engineered barriers, all the RAM will decay in place) in the proposed Action Plan, and apply for a blanket approval to dispose of short lived RAM from patients treated with radioisotopes.

For reference, the total estimated radioactivity that may be released in a patient is detailed in NRC Regulatory Guide 8.39, which is duplicated in Appendix B as Table 1. The solid waste facility operator will always have the option to reject any waste load causing an alarm; however, no vehicle containing RAM shall leave the facility without written approval and an authorized DOT Exemption Form issued by the Department.

Upon formal request and appropriate environmental analysis, the Department's Director of the Bureau of Radiation Protection may authorize disposal of RAM with a half-life greater than 65 days, if the material is not under state or federal regulatory controls and/or disposal restrictions. (See Appendix D for additional guidance.)

B. Naturally Occurring Radioactive Material

If the gamma spectroscopy or other measurement indicates the radiation is from NORM or TENORM, the Action Plan should outline an approach to determine the nature of the waste, or perhaps cover material, entering the facility. If the radiation source is determined to be from the undisturbed natural environment of the Commonwealth (e.g., cover material soil or rock with elevated NORM levels), then there are no disposal restrictions and the material can be accepted at the facility. Similarly, if the source is determined to be potassium or any related compound (e.g., potassium permanganate used for odor control), with a natural abundance K-40, there are no processing or disposal restrictions.

In the case where process knowledge would indicate the presence of TENORM, the DEP Area Health Physicist may authorize immediate disposal. However, the following conditions must be satisfied: a) the volume of waste does not exceed one cubic meter, b) the gamma radiation level at a distance of 5 cm from any source surface does not exceed $0.5 \mu\text{Sv hr}^{-1}$ ($50 \mu\text{rem hr}^{-1}$), and c) the concentration of combined radium isotopes does not exceed 5.0 pCi g^{-1} . A facility may submit, in their proposed Action Plan, to obtain a blanket approval for disposal of such small quantities of waste with TENORM. For a blanket approval, the applicant shall provide appropriate justification (e.g., presence

of engineered barriers) in the proposed Action Plan. Disposal of waste with TENORM of higher volumes, emitting higher radiation levels, or at higher radium concentrations, may be approved by the Department's Director of the Bureau of Radiation Protection. Such evaluations shall require the appropriate environmental assessment and pathway analysis to demonstrate that the annual dose to any member of the public is unlikely to exceed those values noted above. (See Appendix D for additional guidance.)

Again, the facility operator may reject any waste load causing an alarm, however, no vehicle containing RAM shall leave the facility without written Department approval and an authorized DOT exemption form.

C. Consumer Products Containing Radioactive Material

If certain consumer products containing radioactive material are observed in waste or cause an alarm - and are subsequently identified through a visual means to be an individual commodity smoke detector, radium dial watch/clock, exempt thorium metal alloy (e.g., welding rod), or uranium glaze/glass product - a facility may propose in their Action Plan that such an individual waste product be disposed of immediately. A recent life cycle analysis of these exempt RAM sources by the NRC notes that the above public dose limits will not be exceeded in such a disposal scenario (see NRC NUREG-1717). The facility Action Plan could have such an allowed disposal scenario for the specific individual items noted above, but should prohibit the disposal of aggregate quantities of these exempt devices or other products without written approval by the Department. It is recommended that smoke detectors, when found, be returned to the manufacturer for appropriated disposal. If a "generally licensed" tritium EXIT sign is found in any waste stream, it shall be returned to a licensed manufacturer for recycle or shipped for proper low-level radioactive waste disposal.

Consumer products containing exempt radioactive materials may be recovered by the facility, and stored for ultimate disposal as low level radioactive waste by the operator. Alternately, the facility operator may reject any waste load causing an alarm; however, no vehicle containing RAM shall leave the facility without written Department approval and an authorized DOT exemption form.

2. Other Facilities

A. RAM from Patients Having Undergone a Nuclear Medicine Procedure

If the gamma spectroscopy or other measurement indicates the radiation is from a radioisotope with a half-life of 65 days or less, the DEP Area Health Physicist may authorize the contents of the waste load to be processed and/or disposed of immediately. (See Appendix A for telephone numbers during normal and non-business hours.) This is provided there is a high likelihood, through radioisotope identification, the RAM is from a patient having undergone a medical procedure, and the disposal does not endanger the health or safety of the facility staff, the public or the environment. Alternately, the facility may provide in the proposed Action Plan, the justification through modeling that the above general public dose limits are met, and apply for a blanket approval to dispose of short lived RAM from patients treated with radioisotopes.

For reference, the total estimated radioactivity that may be released in a patient is detailed in NRC Regulatory Guide 8.39, which is duplicated in Appendix B as Table 1. The solid waste facility operator will always have the option to reject any waste load causing an alarm, or forward the waste load to a solid waste facility that will process or dispose of the material. However, no vehicle containing RAM shall leave the facility without written approval and an authorized DOT Exemption Form issued by the Department.

Upon formal request and appropriate environmental analysis, the Department's Director of the Bureau of Radiation Protection may authorize processing or disposal of RAM with a half-life greater than 65 days, if the material is not under state or federal regulatory controls and/or disposal restrictions. (See Appendix D for additional guidance.)

B. Naturally Occurring Radioactive Material

If the gamma spectroscopy or other measurement indicates the radiation is from NORM or TENORM, the Action Plan should outline an approach to determine the nature of the waste entering the facility. If the radiation source is determined to be from the undisturbed natural environment of the Commonwealth (e.g., soil or rock with elevated NORM levels), then there are no processing or disposal restrictions and the material can be accepted at the facility. Similarly, if the source is determined to be potassium or any related compound (e.g., potassium permanganate used for odor control), with a natural abundance K-40, there are no processing or disposal restrictions.

In the case where process knowledge would indicate the presence of TENORM, the DEP Area Health Physicist may authorize immediate disposal. However, the following conditions must be satisfied: a) the volume of waste does not exceed one cubic meter, b) the gamma radiation level at a distance of 5 cm from any source surface does not exceed $0.5 \mu\text{Sv h}^{-1}$ ($50 \mu\text{rem h}^{-1}$), c) the concentration of combined radium isotopes does not exceed 5.0 pCi g^{-1} , and d) the processing or disposal of such material will not cause any above stated general public dose limit to be exceeded. A facility may submit, in their proposed Action Plan, to obtain a blanket approval for disposal of such small quantities of waste with TENORM. For a blanket approval, the applicant shall provide appropriate justification and modeling in the proposed Action Plan.

Processing or disposal of waste with TENORM of higher volumes, emitting higher radiation levels, or at higher radium concentrations, may be approved by the Department's Director of the Bureau of Radiation Protection. Such evaluations shall require the appropriate environmental assessment and pathway analysis to demonstrate that the annual dose to any member of the general public is unlikely to exceed those values noted above. (See Appendix D for additional guidance.)

Again, the facility operator may reject, or forward to a landfill that will accept it, any waste load causing an alarm. However, no vehicle containing RAM shall leave the facility without written Department approval and an authorized DOT Exemption Form.

C. Consumer Products Containing Radioactive Material

If certain consumer products containing radioactive material are observed in waste or cause an alarm - and are subsequently identified through a visual means to be an individual commodity smoke detector, radium dial watch/clock, exempt thorium metal alloy (e.g., welding rod), or uranium glaze/glass product - a facility may propose in their Action Plan that such an individual waste product be processed or disposed of immediately. A recent life cycle analysis of these exempt RAM sources by the NRC notes that the above public dose limits should not be exceeded in such processing or disposal scenario (see NRC NUREG-1717). The facility Action Plan could have such an allowed processing or disposal scenario for the specific individual items noted above, but should prohibit the processing or disposal of aggregate quantities of these exempt devices or other products without written approval by the Department. It is recommended that smoke detectors, when found, be returned to the manufacturer for appropriated disposal. If a "generally licensed" tritium EXIT sign is found in any waste stream, it shall be returned to a licensed manufacturer for recycle or shipped for proper low-level radioactive waste disposal.

Consumer products containing exempt radioactive materials may be recovered by the facility, and stored for ultimate disposal as low level radioactive waste by the operator. Alternately, the facility operator may reject, or forward to a landfill that will accept it, any waste load causing an alarm. However, no vehicle containing RAM shall leave the facility without written Department approval and an authorized DOT exemption form.

3. Records and Reports

A. Each person or municipality who operates a waste processing or disposal facility which has detected radioactive materials in any manner or radiation levels in excess of Action Level One to cause an alarm shall maintain records of each incident, containing the information set forth in section b, below, in the facility's daily operational record.

B. The daily operational record should include information required by regulation, such as the following:

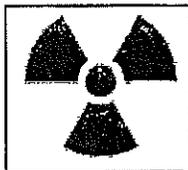
- 1) Date, time and location of the occurrence,
- 2) A brief narrative description of the occurrence,
- 3) Specific information on the origin of the material, if known,
- 4) A description of the RAM involved, if known,
- 5) The name, address and telephone number(s) of the supplier, handler or transporter of the RAM contaminated waste, the name of the driver, and
- 6) The final disposition of the material (processed, disposed, or rejected).

C. The facility's annual report should include a record of detected RAM summarizing the above information.

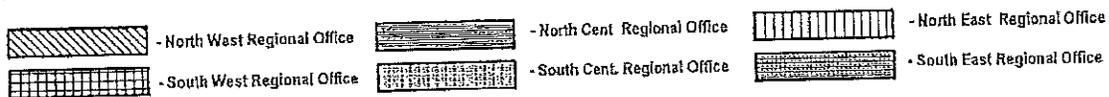
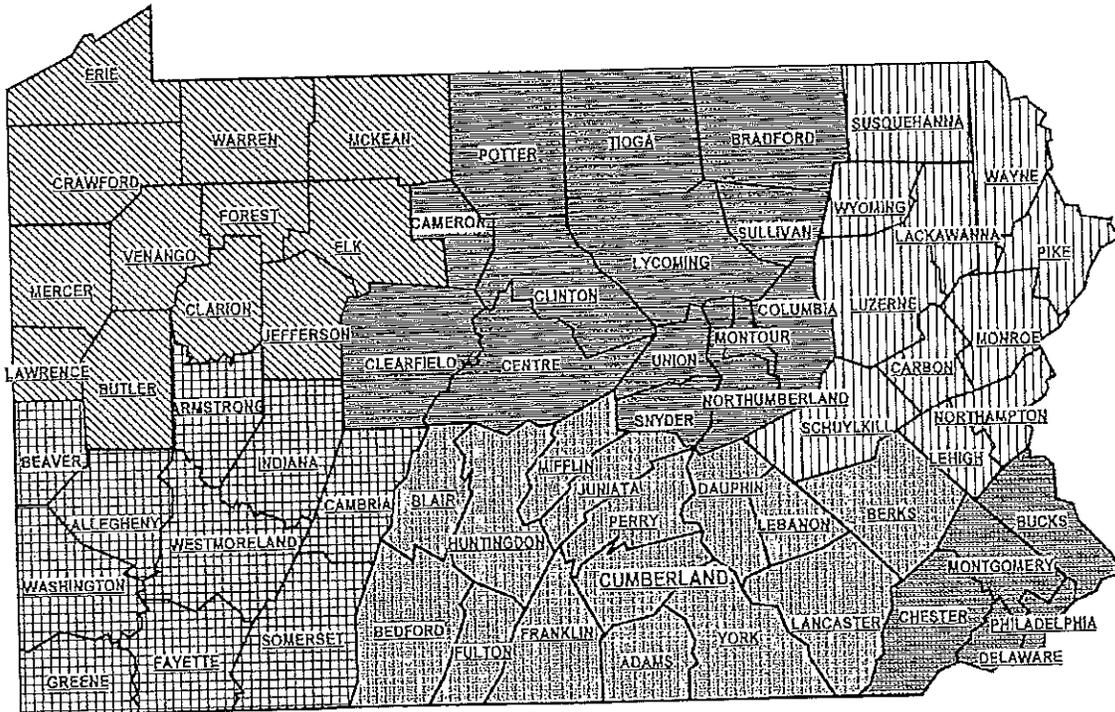
4. Monitoring and Equipment Facilities monitoring for radiation emitted from radioactive material must have appropriate monitoring equipment onsite. (See Appendix C for more information). Employees should be trained on proper use of all fixed and portable

equipment. Additionally, facility operational staff should be trained to visually monitor waste during transfer or unloading for the potential presence of RAM. Specifically, they should be able to identify the caution "radiation symbol" on containers, and items that may not be detected by gamma monitors (e.g., tritium "EXIT" signs).

RADIATION SYMBOL



**APPENDIX A. NOTIFICATION OF INCIDENTS OF RAM IN SOLID WASTE AND/OR
REQUEST FOR DOT EXEMPTION FORM (Rev. 2-1-01)**



<u>Department of Environmental Protection</u>		
<p><u>Area Health Physicist</u> Business hours: (412) 442-4227</p> <p>Northwest Region: Butler, Clarion, Crawford, Elk, Erie, Forest, Jefferson, Lawrence, McKean, Mercer, Venango and Warren Counties. Emergency Coordinator Non-business hours: (800) 373-3398</p> <p>Southwest Region: Allegheny, Armstrong, Beaver, Cambria, Fayette, Greene, Indiana, Somerset, Washington and Westmoreland Counties. Emergency Coordinator Non-business hours: (412) 442-4000</p>	<p><u>Area Health Physicist</u> Business hours: (717) 705-4712</p> <p>Northcentral Region: Bradford, Cameron, Clearfield, Centre, Clinton, Columbia, Lycoming, Montour, Northumberland, Potter, Snyder, Sullivan, Tioga and Union Counties. Emergency Coordinator Non-business hours: (570) 327-3696</p> <p>Southcentral Region: Adams, Bedford, Berks, Blair, Cumberland, Dauphin, Franklin, Fulton, Huntingdon, Juniata, Lancaster, Lebanon, Mifflin, Perry and York Counties. Emergency Coordinator Non-business hours: (877) 333-1904</p>	<p><u>Area Health Physicist</u> Business hours: (484) 250-5900</p> <p>Northeast Region: Carbon, Lackawanna, Lehigh, Luzerne, Monroe, Northampton, Pike, Schuylkill, Susquehanna, Wayne and Wyoming Counties. Emergency Coordinator Non-business hours: (570) 826-2511</p> <p>Southeast Region: Bucks, Chester, Delaware, Montgomery and Philadelphia Counties. Emergency Coordinator Non-business hours: (484) 250-5950</p>

APPENDIX B. ACTIVITIES AND DOSE RATES FOR AUTHORIZING
PATIENT

RELEASE FROM MEDICAL FACILITIES²

Table 1. Activities and Dose Rates for Authorizing Patient Release[†]

Radioactive Material	COLUMN 1 Activity at or Below Which Patients May Be Released		COLUMN 2 Dose Rate at 1 Meter, at or Below Which Patients May Be Released*	
	(GBq)	(mCi)	(mSv/hr)	(mrem/hr)
Ag-111	19	520	0.08	8
Au-198	3.5	93	0.21	21
Cr-51	4.8	130	0.02	2
Cu-64	8.4	230	0.27	27
Cu-67	14	390	0.22	22
Ga-67	8.7	240	0.18	18
I-123	6.0	160	0.26	26
I-125	0.25	7	0.01	1
I-125 implant	0.33	9	0.01	1
I-131	1.2	33	0.07	7
In-111	2.4	64	0.2	20
implant	0.074	2	0.008	0.8
Pd-103 implant	**	**	**	**
Re-186	1.5	40	0.03	3
Re-188	28	770	0.15	15
Sc-47	29	790	0.20	20
Se-75	11	310	0.17	17
Sm-153	0.089	2	0.005	0.5
Sn-117m	26	700	0.3	30
Sr-89	1.1	29	0.04	4
Tc-99m	**	**	**	**
Tl-201	28	760	0.58	58
Y-90	16	430	0.19	19
Yb-169	**	**	**	**
	0.37	10	0.02	2

† The activity values were computed based on 5 millisieverts (0.5 rem) total effective dose equivalent.

* If the release is based on the dose rate at 1 meter in Column 2, the licensee must maintain a record as required by 10 CFR 35.75(c) because the measurement includes shielding by tissue. See Regulatory Position 3.1, "Records of Release," for information on records.

** Activity and dose rate limits are not applicable in this case because of the minimal exposures to members of the public resulting from activities normally administered for diagnostic or therapeutic purposes.

² Source: Regulatory Guide 8.39, Release of Patients Administered Radioactive Materials. U.S. Nuclear Regulatory Commission, Washington, D.C. April 1997.

APPENDIX C. GUIDELINES FOR RADIOLOGICAL MONITORING EQUIPMENT

1. General Information About Radiation Detectors

In general, radiation detection equipment consists of a detector and electronics to convert the signal received by the detector into meaningful values. The passage of radiation through the detector (or probe) causes an impulse to be generated within the detector, which is converted into a preset unit, usually counts per minute (cpm). There are two general types of detectors likely to be used in municipal and residual waste monitoring. The first, called a Geiger-Muller (G-M) counter with thin window probe, converts electrical discharge pulses into counts, which are displayed on a meter. This is the best type of detector for detecting beta particles, because most of the beta particles that pass into the detector will register. However, certain low-energy beta particles will not penetrate through the outer wall of the detector and, therefore, will not be detected. Examples of radioactive materials emitting such low-energy beta particles include carbon-14 and tritium (hydrogen-3), which are commonly used in medical research programs and may inadvertently be disposed of in waste. This type of detector is gas-filled and is less efficient at detecting gamma radiation because most pass through the detector without causing a pulse to be generated. Nevertheless, G-M counters are normally used in hand-held instruments, and a "pancake" type thin window G-M probe can be used for alpha, beta, and gamma measurements when properly calibrated.

The second type of radiation detector also uses a probe that converts the impulses caused by the radiation striking the detector surface into counts, which are recorded on the meter. However, this type of detector differs from the G-M counter in that the signal transferred to the meter is dependent on the radiation type and energy striking the detector. Typically, this type of radiation detector is called a scintillation detector. Scintillation detectors convert the radiation energy into a light impulse within the probe. The amount of light generated is based on the amount of radiation that strikes the probe. This light impulse is then converted to a measurement that may be used to determine the energy of the radiation and the total amount of radiation. Because of this capability, scintillation detectors are useful in determining the type of radioactive material present in the waste as well as the relative radiation hazard associated with the material. Scintillation detectors are also more efficient at detecting gamma radiation than a G-M counter because they are solid material (i.e., a greater number of interactions occur between the detector and the radiation yielding a greater number of counts). Zinc sulfide scintillation detectors may be used to quantify the amount of alpha particle radiation from contamination materials, although this is often conducted in laboratories rather than field settings. In addition, the scintillation medium may be liquid, thus allowing greater contact of the medium with the radioactive material and further increasing the efficiency of the measurement. Liquid scintillation is often used to quantify the amount of radioactive materials that emit low-energy beta particles, such as carbon-14 and tritium. However, this technique is employed exclusively in laboratories, rather than in the field.

Sodium iodide (NaI) crystals, germanium crystals, zinc sulfide coatings, and specially formulated plastic materials are the most common media used in solid scintillation detectors. Plastic scintillation detectors may be more sensitive to beta/gamma radiation than NaI detectors due to size and window thickness, however neither detect alpha radiation. In addition, plastic

detectors are usually more resistant to environmental stresses than NaI detectors and can be purchased in larger sizes, allowing better geometry for detection of radioactive material in waste. However, though plastic detectors may be less expensive than NaI detectors, they may not offer the same degree of discrimination in terms of identifying the energies of the gamma radiation. Solid state germanium detectors are often used in laboratories for precise determination of the type and amount of radioactive materials present. Although some germanium detectors are sufficiently rugged to be used in the field, most are designed for use in laboratories.

2. Facility Monitoring Equipment

Many solid waste facilities have installed radiation detection equipment at the entrance portal to the facility or in conjunction with other onsite facilities, such as scales. In such installations, the radiation detector elements (e.g., NaI crystals) are typically installed to screen incoming waste and should be installed, operated, and maintained in a manner that ensures that the measurements are meaningful and fulfill the objectives for detecting radiologically contaminated waste. The detectors should be positioned as close as practical to the waste load, and calibrated so that they measure radiation [in $\mu\text{R h}^{-1}$, or equivalent counts per unit time] emitted from vehicles that are used to haul the solid waste into or out of the facility. The waste load portal detectors are normally scintillation type detectors. In the scenario where time permits (i.e., waste loads are infrequent) or fixed portal monitors become inoperable, hand-held microR meters may be used to scan incoming waste loads.

Both fixed and portable scintillation and G-M detectors can be calibrated to display radiation in units of exposure rate ($\mu\text{R h}^{-1}$), or dose equivalent rate ($\mu\text{rem h}^{-1}$). Equipment that display in counts per unit time should have calibration factors that can be related to these qualities. The radiation unit displayed by the detector is less important than the selection of the appropriate type of radiation detector element or probe, and the proper subtraction of background radiation is made. Factors that should be considered when developing radiation detection and monitoring programs are:

- Area background radiation level,
- Detector efficiency and ruggedness,
- Detector calibration and response checks,
- Detector positioning and shielding,
- Detector element physical protection,
- Counting time,
- Alarm set point,
- Overall system sensitivity, and
- Alarm response procedures and training.

Because of the complex nature of radiation detection instrumentation and the multiple objectives for which such instruments may be deployed, facility staff should be trained to determine the appropriate type of instrument and/or detector probe to be used at a facility based on the established operational objectives. In addition, it is recommended that only individuals with proper experience and training (e.g., manufacturer's representative or knowledgeable health physicist) should be permitted to initially install, calibrate fixed radiation detection equipment.

3. Monitoring Equipment – General Recommendations

Facilities shall comply with specific regulatory requirements, but the following general recommendations for monitoring equipment may be used for initial detection of radioactive material at solid waste facilities:

- A. Monitoring equipment should consist of both portable (hand-held) and fixed radiation monitoring equipment. Portable instrumentation should have multiple probes for contamination and a range of gamma dose rate measurements (i.e., $10 \mu\text{R h}^{-1}$ to over 50 mrem h^{-1}).
- B. Fixed monitoring equipment should be capable of detecting and displaying ambient background radiation levels. For both portable and fixed instrumentation, the equipment should provide a visual readout of the $\mu\text{Sv h}^{-1}$, $\mu\text{rem h}^{-1}$, $\mu\text{R h}^{-1}$ or count rate (e.g., cpm) level. Should the background radiation level be above $10 \mu\text{R h}^{-1}$, the detector elements will require shielding to maintain the rate below this level.
- C. The readout on the instrumentation should allow either scale multiplying factors or logarithmic scales to display higher radiation levels.
- D. Portable instrumentation should be powered either by replaceable batteries or power cells with charging units and provide indication if battery/power cell capacity is not at levels for proper unit function. Fixed instrumentation should be line operated (e.g., 110 volt AC).
- E. Waste monitors should be installed according to the manufacturers recommendations, with the radiation detectors as close as practicable to the waste load (i.e., close as possible and preventing physical damage). The alarm set-point for fixed monitoring equipment shall be no higher than $10 \mu\text{R h}^{-1}$ above background, with a cesium-137 gamma radiation field at the radiation detector element(s). The ambient gamma background in Pennsylvania ranges from about $5 \mu\text{R h}^{-1}$ to $25 \mu\text{R h}^{-1}$. Instrument readings in microrentgen per hour ($\mu\text{R h}^{-1}$), or equivalent counts per unit time (e.g., cpm), will need to be averaged during calibration to determine the appropriate alarm set point. If capable of energy discrimination, the radiation monitor shall be set to detect gamma rays of a 50 kiloelectron volt (keV) energy or higher. The alarm should provide an audible signal to the operator and may provide a visible signal that the alarm set point has been exceeded. The operator should be able to reset the audible signal from the readout position. Written indication of radiation levels, such as by a data log print out or chart recording, may be available as an option for the readout.
- F. The detector element assemblies for fixed monitoring may be located at or near the weigh scale for vehicles. Provision should be made to stop or slow the vehicle during the monitoring for radioactive material, with a geometry and collimation of the radiation detectors to maximize system sensitivity. It is recommended an appropriate housing and other barriers be installed to protect the detector assembly from physical damage due to vehicles and from environmental conditions, such as precipitation, high humidity, and thermal variation.

- G. If the detector assembly for fixed monitoring equipment is supplied with electrical power other than the monitoring unit, provision should be made to display power condition or availability to the detector assembly.
- H. The range of readout for portable (hand-held) monitoring equipment and various probes should be 0.01 to approximately 100 mrem h⁻¹, and have a known gamma energy response. A "pancake" type G-M probe will be adequate for gross counting of wipes taken for gross contamination evaluations of vehicles. Again, hand-held microR meters would be suitable for temporary vehicle monitoring if fixed systems become inoperable.
- I. The monitoring equipment used at solid waste facilities should be calibrated no less frequently than annually, and (if utilized) its function should be tested on a daily basis using a check source for which the instrument's expected response has been previously determined.

4. Evaluation Equipment

If a radiation alarm is determined to be valid, evaluation of waste may require supplies, calibrated survey meters with capabilities similar to those specified above, and may require any of the following to determine the specific radioisotope, and if contamination is present:

- A. Portable multichannel analyzer (MCA) coupled to a sodium iodide (NaI) detector or solid state detector. Appropriate calibration source(s) will also be needed to check the library of spectra.
- B. Probes for survey meter capable of detecting beta and gamma radiation. Depending on the survey meter and probe(s) used for beta/gamma monitoring, a different probe could be obtained for alpha monitoring, if desired.
- C. Supplies for taking samples for laboratory analysis, such as wipes (or smears), containers for water and soil/waste samples, plastic bags, indelible markers, trowels, tongs, etc. would be useful to have on hand.
- D. Plastic tarps, disposable protective clothing and gloves for personnel handling potentially contaminated waste. *(Note: the use of some types of protective mask requires that the employing firm have an approved respirator qualification program.)*
- E. A supply of radiation warning signs, rope, tape, etc.
- F. Supplies and information for data analysis, e.g., scientific calculator, survey forms, tables of radioisotopes with half-life, etc.

APPENDIX D. GUIDELINES FOR ACTION PLANS FOR DETECTION AND HANDLING OF RADIOACTIVITY AT SOLID WASTE FACILITIES

1. Procedures for Development and Review of Action Plans

A. Qualifications of Persons Preparing the Action Plan

Plans should be prepared by individuals having, at a minimum, the following qualifications:

- 1) Two years of on-the-job training in health physics; or one year of on-the-job training in health physics plus one year of formal college level study in health physics, physics, chemistry, biology, engineering, or radiation science.
- 2) Experience with radiation detection and measurement, and in developing radiation safety procedures and plans.

Comprehensive certification by the American Board of Health Physics satisfies numbers 1 and 2, above. It is recommended that facilities employ a certified health physicist (CHP) as a consultant for developing and implementing their Action Plan.

B. Implementation of the Action Plan

The provisions of the Action Plan should be activated whenever situations arise in which the pre-established action levels are exceeded.

C. Persons Responsible for Implementation of the Action Plan

Each facility should designate an individual responsible for implementation of the Action Plan. This individual should have adequate authority to implement the plan. In the event that the individual(s) implementing the Action Plan is/are different from the individual who prepared the Action Plan, the Action Plan should specify a minimum one day training session in the fundamentals of radiation safety and detection.

(Note: Provided onsite operational facility personnel are able to appropriately respond to the radiological scenarios at Action Levels One and Two, the Action Plan may reference the use of corporate or consultant health physics support staff for further RAM characterization.)

D. Revision of the Plan

The plan should be reviewed and updated periodically by the permittee. At a minimum, this should occur when any of the following occurs:

- 1) Applicable Department regulations or policies are revised.
- 2) The Action Plan fails during an incident.

- 3) The facility operation changes in a manner that would interfere with implementation of the Action Plan.
- 4) The individual responsible for implementing the plan changes.
- 5) The monitoring equipment used is changed.
- 6) The designated area for vehicles in which RAM has been detected changes.
- 7) As otherwise required by the Department.

2. Content and Format of Action Plans

A. General Instructions

The main elements of the Action Plan should cover all the appropriate regulatory requirements, and are described in this basic guidance document. Details are outlined below. Certain Action Plan elements may not be entirely applicable or appropriate for a specific facility or type of incident. In these cases, the person preparing the Action Plan should act accordingly and provide a brief explanation as to why the Action Plan element(s) in question are not applicable or appropriate.

The most important thing to remember in developing an Action Plan is that the actual effectiveness of the plan will depend upon its simplicity, readability and summary instructions for facility operational staff.

B. Action Levels

The Action Plan must be designed to address two radiological scenarios or action levels, namely:

Action Level One: A radiation monitor alarm at the facility indicating the potential presence of radioactive material in a waste load.

(Note: The regulations require a gamma exposure rate from a cesium-137 source, at a level no higher than 10 $\mu\text{R h}^{-1}$ above the average local background, at any detector element, shall cause an alarm at the facility. Instrument background shall be kept below 10 $\mu\text{R h}^{-1}$ using shielding if needed, and the system shall be set to detect gamma ray energies of 50 kiloelectron volts and higher.)

Action Level Two: Radiation dose rates of 20 $\mu\text{Sv h}^{-1}$ (2 mrem h^{-1}) or greater in the cab of the waste transport vehicle, 500 $\mu\text{Sv h}^{-1}$ (50 mrem h^{-1}) or greater from any other surface, or the detection of contamination on the outside of the vehicle shall require immediate notification of the Department, and isolation of the vehicle.

The Action Plan should provide for notification of the Department.

- 1) For Action Level One, notification and request for DOT Exemption Form prior to rejection of a waste load, or request for disposal or processing approval of RAM in solid waste if blanket approval was not requested.
- 2) For Action Level Two, notification must be made immediately.

C. Detection and Initial Response

Fixed and portable radiation monitoring systems shall be calibrated annually to a traceable cesium-137 source. This radiation standard shall be traceable to the U.S. National Institute of Standards and Technology. Radiation monitors may be response checked daily on a relative basis. If the alarm level of $10 \mu\text{R h}^{-1}$ over background is exceeded when a vehicle is at the monitoring location, the following procedures are recommended:

- 1) Reset the monitor alarm and evaluate the vehicle or container a second time.
- 2) If the alarm level is still exceeded, promptly survey the vehicle surfaces at a distance of 5 cm with a portable radiation survey meter to determine if Action Level Two levels are exceeded, and if an area of highest radiation level can be determined. Mark this location with chalk if other gamma spectroscopy measurements are to be performed.
- 3) If surveying the vehicle with a portable survey meter at 5 cm fails to reveal the presence of radioactive material, scan the driver with a portable survey meter (or have him/her stand between the monitor detectors) to determine if the driver has triggered the alarm. Alarms have been triggered by drivers who have undergone nuclear medicine procedures involving radioactive material. If this is the case, and the driver alone has triggered the alarm, no further action under this guidance document is necessary.
- 4) **Action Level One:** If the radiation monitor alarmed on a second count, the following procedures are recommended:
 - a) Remove the vehicle to the Designated Area for vehicles found to contain RAM. (See D below.) Contact the individual responsible for supervising response to alarms at the facility. If the waste load is to be rejected, contact the appropriate DEP Area Health Physicist for approvals. If disposal or processing is considered, keep the load onsite until the nature of the RAM and proper actions are determined. Do not allow the vehicle or container to leave the facility without the permission of the Department, and the driver being issued a DOT Exemption Form signed by the Department's Area Health Physicist or their authorized representative. If a driver leaves the facility with a contaminated waste load, they must carry a copy of the signed DOT Exemption Form. (*Note: once a solid waste*

facility has an approved Action Plan, it is anticipated that facility survey data and DOT Exemption Form can be exchanged via fax to allow for immediate action on the part of the Department.)

- b) If the driver leaves with the vehicle without a DOT Exemption Form and before the RAM can be evaluated, contact the Pennsylvania State Police and provide them with any information you may have on the vehicle such as make, model, color, company name, license plate number, time left and the direction in which the vehicle was traveling and, if possible, the intended destination. This is to ensure that the driver does not dispose of the contaminated waste improperly. Notify the appropriate DEP Area Health Physicist listed in Appendix A and apprise that individual of the situation.
- 5) Action Level Two: If the dose rates indicated by a radiation survey at a distance of 5 cm equal or exceed either limit in this Action Level on the exterior or in the cab of the vehicle, remove the driver and all other personnel from the immediate area. Similarly, if contamination is detected by wiping vehicle areas that may have contacted the waste during loading, or seams that may leak liquid, isolated the vehicle and call the Department's Area Health Physicist for your location as listed in Appendix A. Proceed as directed by the Area Health Physicist.

D. Designated Area

The Action Plan should include the location of a Designated Area for vehicles found to contain RAM. This area is to be used for surveys, and if needed, to isolate a vehicle or container to maintain personnel radiation exposure ALARA. If surveys show that either exterior dose rate limit in Action Level Two is exceeded, but there is no removable contamination on the exterior of the vehicle and the dose rate in the cab is below 50 mrem/hr, the vehicle should be promptly moved to the Designated Area for an additional characterization or evaluation by facility or Department staff. The area should be appropriate for the various types of RAM potentially found in waste, size of facility, size of truck, employees in the proximity of the truck, and any other suitable steps warranted by the potential situation at hand and site-specific facility layout. Protection of the health and safety of facility operators, and the environment, may be achieved through consideration of time, distance, shielding, and contamination containment.

E. Characterization

If blanket approval is requested for immediate disposal or processing of short lived RAM from patients, NORM, TENORM, or individual consumer products containing RAM (as described above), the Action Plan must have procedures for characterizing the radioactive material present in the waste. Characterization is best executed under the direct supervision of the person who prepared the Action Plan, or another similarly trained and qualified individual. The Action Plan should address steps to confirm the radiation level detected by the monitoring device and identify the radioisotope(s).

At Action Level One, the procedure to identify the radioisotope must include means to determine the gamma ray spectrum. Procedures used in the characterization phase should be situation specific and will be determined by many factors including the type of truck and how it is loaded, the nature of the waste, radiation levels indicated by the survey, highest dose rate, location of RAM in the load, instrumentation, personnel available, weather, and other factors.

At Action Level Two, radiation protection personnel from DEP, and perhaps federal agencies, may come onsite to provide additional guidance and assistance.

In general, appropriate characterization procedures should include the following:

- 1) If the cab radiation level is over 2 mrem/hr, vehicle surface is over 50 mrem/hr, or contamination is detected - immediately notify the Department's Area Health Physicist. If there is no contamination and the cab radiation level is less than 50 mrem/hr, promptly relocate the vehicle or container to the Designated Area. Using appropriate instrumentation and measurement set-up, identify the radioisotope (i.e., via gamma spectroscopy).

If the gamma spectroscopy indicates the radiation is from RAM with a half-life of 65 days or less and is most likely from a patient having undergone a medical procedure, the DEP Area Health Physicist may authorize the contents to be processed or disposed of immediately in the facility, provided there is minimal risk to workers. Alternately, the waste load may be rejected. As noted above, a solid waste facility may apply for a blanket approval to process or dispose of certain RAM in waste (i.e., short lived radioisotopes from patients, NORM, TENORM and individual consumer products).

- 2) Survey the exterior of the vehicle with a portable survey meter set at the most sensitive setting and holding the survey meter no more than two inches (5 cm) from all vehicle surfaces. Mark areas where radiation levels appear to be the highest. If containerized, monitor the waste during unloading from the vehicle. If the radiation levels from the vehicle or any container exceeds 50 mrem/hr at any time during unloading, stop removing the waste, remove personnel from the area and call the DEP Health Physicist at the numbers provided in Appendix A.
- 3) If contamination is found or the dose rate on the vehicle or cab exceed Action Level Two, Department staff will oversee the surveying the waste vehicle or containers (if waste is containerized in the vehicle). Personnel who are handling the waste to isolate the source should have appropriate training, wear radiation monitoring devices, protective clothing, including coveralls, boots, gloves and dust masks to avoid skin contamination, inhalation, or ingestion with the radioactive material or other potentially hazardous material. The Action Plan and facility should provide for personal protective equipment for facility or consultant personnel if waste off-loading is anticipated.

- 4) If the waste is containerized, remove the individual waste containers (if not contaminated) from the vehicle and survey each with a survey meter. Look for signs and container labels that might identify the radioactive material or other hazards and the point of origin. Caution should be exercised to ensure that injuries do not occur during removal of the waste containers. Do not attempt to open containers and sort through the waste. The waste may contain sharps, biological waste, and other pathological or hazardous waste that could cause immediate, and more significant risks to the workers.
- 5) If the waste load is in bulk form and can not be processed or disposed of in the facility or rejected, remove the bulk waste until the estimated location of the radioactive source is approached. Survey bulk waste removed with the portable meter to isolate the RAM. When the source is located, attempt to separate the RAM from the waste, provided it can be done without jeopardizing the health and safety of workers due to other hazards present in the waste. The Action Plan should specify precautions to be taken to monitor external exposure and prevent workers from becoming contaminated by the radioactive material in this process. The contaminated material should be placed in containers and taken to the Designated Area where it can be stored safely and in a manner that protects facility staff, and prevents environmental contamination (e.g., due to runoff, infiltration, pests, etc.) until the means of disposition is determined.
- 6) If radiation is detected at more than 0.5 mSv h^{-1} (50 mrem h^{-1}) above background levels on the surface of any container, isolate this area within the facility property and contact the DEP Area Health Physicist.
- 7) The area(s) where radioactive material is identified per (5) and (6) above, should be roped off or otherwise secured to prevent persons from entering areas where radiation levels exceed 0.02 mSv h^{-1} (2 mrem h^{-1}), and labeled with appropriate signs. Radiation levels in areas occupied by operational staff should be kept ALARA. The contaminated waste should be physically secured against removal or inadvertent disposal or else be under observation by facility staff at all times.
- 8) If radioactive material is not detected in any of the waste containers or in the bulk waste, resurvey the exterior of the vehicle. Mark any areas where radiation levels exceed background levels. The source of the radiation may be the transport vehicle itself (i.e., contamination or a small sealed source).

F. Determination of Origin.

The plan should include procedures to determine the place where the waste originated that contained RAM. These procedures should be thorough (e.g., interview driver) and capable of providing the best attempt to determine the origin of the waste. This effort is most likely to be successful with monitoring at the transfer station.

G. Disposition and/or Storage.

The plan should have procedures for rejection, disposition, or perhaps storage for decay of the waste containing RAM in accordance with the requirements and recommendations set forth in this guidance document. The procedures must take into account the radiation level, the type and amount of waste involved, the radioactive material present in the waste, the form in which the radioactive material is present, availability of the storage option at the waste processing site, and the health and safety of personnel handling such waste or present in the immediate area.

Experience to date indicates that many, if not most, alarms at solid waste facilities involve radioactive materials used in medical procedures which have half-lives sufficiently short (i.e., less than 65 days) that it is practical to either process or dispose of the waste immediately, or to store the waste in a secure area until it has decayed to a non-radioactive form. If the waste is contaminated with short-lived radioisotopes from medical procedures, and the facility operator requests blanket approval to be disposed or processed at a solid waste facility immediately, the proposed Action Plan should contain a justification and/or pathway analysis indicating that the RAM will decay in place or not cause a radiation dose to the general public above respective limits noted above. Similarly, for NORM, TENORM or individual consumer products containing RAM, the disposal or processing shall not cause a radiation dose to the general public above applicable limits.

H. Training

The Action Plan should provide for training of individuals responsible for implementing the plan in the areas of:

- 1) Fundamentals of radiation safety.
- 2) Operation of the monitoring instrumentation used by the facility, including daily operation and other response checks.
- 3) All aspects of the Action Plan.

I. Other Items to be Included

- 1) Provision for written alarm procedures to be posted where they can be seen by the personnel performing the waste monitoring. The alarm procedures should be coordinated in advance with facility personnel, including appropriate notification of DEP or other applicable state or local agencies and authorities.
- 2) Posting of notices so that waste haulers will be aware of the procedures that will be followed if radiation and radioactive material is detected in their vehicle, including notification of out-of-state radiation protection authorities and declaration of where the waste will be returned. Again, any rejected waste load must have an approved DOT Exemption Form from the Department.

- 3) Procedures to ensure that at least one individual per shift is trained in and responsible for the implementation of response procedures in the event an alarm is activated.
- 4) Informing customers in advance of the procedures in the event that an alarm point is exceeded, especially if the procedures include "waste load rejection" provisions under which the suspect waste may be promptly returned to the shipper.
- 5) Instructing facility personnel on the appropriate procedures to be followed in the event the alarm is activated. The instructions should include graduated contingency plans in the event that RAM in waste is detected, or criteria of Action Level Two is exceeded.

APPENDIX E. BACKGROUND INFORMATION ON RADIOACTIVE MATERIAL IN SOLID WASTE

1. Introduction

Radioactive material is used for a variety of beneficial purposes in the United States, including medical diagnosis and treatment and materials testing. The use and disposal of most types of radioactive material are regulated by the Nuclear Regulatory Commission (NRC) and individual states. Other types of radioactive material are regulated by the Environmental Protection Agency (EPA) and the States. Although low-level radioactive waste must be disposed of in a licensed radioactive waste disposal facility, occasionally unregulated RAM (e.g., from patients having undergone a medical procedure) is found at solid waste processing sites that are not licensed by the NRC or states for the control radiation hazards. Additionally, with increasing frequency, NORM, TENORM or consumer products are detected, as well as less frequent lost or improperly discarded higher hazard radioactive sources.

Radioactive materials in municipal waste have been detected with increasing frequency at landfills, incinerators, transfer stations, and associated facilities. This increase can be partially attributed to increased use of radiation detection instruments at the solid waste facilities. The operators of facilities have been installing such instruments in response to concerns by regulatory agencies and the public or in an attempt to limit liability for potentially costly remedial actions for radioactive contamination. When radioactive contamination is detected, it often prompts an emergency response until the potential hazards posed by the waste are determined and the material is properly controlled.

2. Sources of the Contamination

It should be noted just about everything contains some trace amount of radioactivity, and the earth is continually bathed in cosmic radiation from space. Radioactive materials exist naturally in soil, rocks, and water. There are a great many of these radioactive materials in construction materials, food, and waste. These materials may also be concentrated artificially above naturally occurring levels in their use or production (i.e., TENORM). In addition to these naturally occurring radioactive materials, municipal waste may also contain radioactive materials that have been introduced in consumer products (e.g., most domestic smoke detectors contain the radioactive material americium-241). These detectors enter the waste stream when consumers dispose of them in municipal waste.

Although the NRC and the Agreement States (States that have assumed regulatory control over certain nuclear materials through an agreement with NRC) strictly control the possession, use, storage, transportation and disposal of certain radioactive materials through their licensing and inspection activities, on occasion, radioactive material can find its way into municipal solid waste streams. Over the last several years, the Department and NRC have monitored event reports involving detection of radioactive materials in municipal wastes. Based on reported incidents, the principal man-made sources of radioactively contaminated waste in municipal waste landfills are medical facilities, private and university laboratories and radiopharmaceutical manufacturers.

The radioactive materials reported in contaminated waste have consisted primarily of the following radioisotopes: iodine-131, technetium-99, thallium-201, gallium-67, iodine-123, indium-111, etc. In most cases, such RAM has been legitimately released within patients in accordance with the NRC and state requirements. However, in other cases the event has been caused in violation of applicable requirements, such as lost sealed sources of cobalt-57 and iridium-192.³

In the practice of nuclear medicine, radioactive materials are administered to patients for the diagnosis or treatment of illnesses such as thyroid cancer or dysfunction. NRC and Agreement State regulations allow patients receiving radiopharmaceuticals to leave the hospital or clinic when the amount of radioactive material present in their bodies has dropped to certain levels or they present a low exposure potential to members for their family and the public. (See Appendix B). After these patients leave the hospital, they may inadvertently contaminate ordinary trash that is then disposed of in municipal solid waste disposal facilities. Contaminated materials that have been generated by nuclear medicine practices and detected at municipal solid waste facilities include diapers, bed linen, disposable medical supplies and general trash (for example, food, plastic and paper dishes and utensils, newspapers and magazines). Again, these items often become contaminated with radioactive materials when they are contacted by patients that have received the nuclear medicine administration, either while the patient is in the hospital or after the patient has returned home. Although the amount of radioactivity in the municipal waste is often small, detection systems used by solid waste facilities are often sensitive enough to detect the radioactive contamination.

Hospital, clinics, laboratories and universities use radioactive materials in research, including the marking and detection of molecules in genetic research, the study of human and animal organ systems, and in the development of new drugs. There is a potential that municipal wastes may become contaminated with radioactive materials when contaminated laboratory trash is inadvertently mixed with municipal waste. Contaminated materials may include contaminated glass or plastic, gloves, animal bedding, or paper lab countertop protectors. Waste from radiopharmaceutical manufacturers is similar to the waste produced by laboratories and universities. On rare occasions, sealed sources are mistakenly discarded from such facilities, and shall be retrieved when detected.

In addition to radioactive material that may inadvertently be included in municipal solid waste, solid waste facilities may detect NORM, which is found in a variety of common household or construction materials. NORM, such as radium, thorium or uranium is often found in bricks, wall board or building rubble containing these construction materials. It should be noted, this NORM was present in the base material that was used to produce these construction materials. Natural potassium also contains trace amounts of the radioisotope potassium-40 (K-40). In sufficient quantities, NORM potassium salts may trigger radiation alarms. In no case, because of radiological concerns, shall the presence of potassium or any related compound (with K-40 at natural abundance levels) prevent the immediate disposal or processing of solid waste.

³ Of particular note and concern is an incident that occurred in Pennsylvania when a high activity iridium-192 source used in cancer treatment was inadvertently disposed of as medical or "red bag" waste - see NRC document number NUREG-1480 for more information.

The NRC and most Agreement States allow licensees with waste contaminated with radioactive material having a short half-life (e.g., less than 65 days), to be held for at least ten half-lives onsite at licensed facilities. After this period, the licensees are allowed to dispose of the decayed waste, if it is indistinguishable from background radiation levels based on an appropriate survey. There have been occasions when municipal waste becomes contaminated when a licensee fails to properly monitor radioactively contaminated waste before releasing it for disposal as ordinary trash. In other reported detection incidents, licensees may have properly managed the waste, but the disposal facility's detection equipment was more sensitive than the licensee's equipment.

The NRC and some Agreement State regulations also allow small quantities of specific radioactive materials used in clinical or laboratory tests to be disposed of as if they were not radioactive. Although no incidents involving the disposal of these types of radioactive material have been reported, incidents involving medical waste have shown that detection systems are capable of detecting the low levels of radioactivity associated with these exempted materials.

Some radioactive materials that could contaminate solid waste include:

<u>Radioisotope</u>	<u>Half-Life</u>	<u>Radiation Type</u>
Iodine-131	8 days	beta, gamma
Iodine-125	60 days	Gamma
Iodine-123	13 hours	Gamma
Technetium-99m	6 hours	Gamma
Indium-111	2.8 days	Gamma
Thallium-201	73 hours	Gamma
Gallium-67	3.3 days	Gamma
Cobalt-57	270 days	Gamma
Hydrogen-3	12 years	Beta
Iridium-192	74 days	beta, gamma
Potassium-40	1.3x10 ⁹ years	beta, gamma
Radium-226	1600 years	alpha, gamma
Uranium-238	4.5x10 ⁹ years	alpha, gamma
Thorium-232	1.4 x 10 ¹⁰ years	alpha, gamma
Americium-241	432 years	alpha, gamma

Lastly, under NRC and Agreement State regulations, some sources and devices may be possessed under a General License. These items include industrial gauging equipment, tritium "EXIT" signs, etc. There is a real potential for such items to be present in solid waste streams. When they are identified through radiation alarms, or visual observation of a GL device or radiation warning symbol, the waste processing facility shall investigate, isolate the item, and contact the Department if needed. Action Plans should contain procedures for the appropriate response if a tritium (hydrogen-3) EXIT sign, or other package with a caution radiation symbol, is observed during processing or disposal of solid waste.

3. What is Radioactivity and Radiation?

The term "radiation" as it relates to "radioactive materials" means the energetic emissions given off by the material as it decays. Ionizing radiation produces charged particles, or ions, in the material that it encounters. Potential adverse effects from radiation on humans are caused by these charged particles, and the energy they deposit in tissues and organs.

Detailed information on radioactivity and radiation is provided in Appendix F.

If you have questions about radiation or require more information, please contact the Bureau of Radiation Protection at the Department of Environmental Protection in Harrisburg (717) 787-2480 or the Area Health Physicist listed in Appendix A for your location.

APPENDIX F. RADIATION PROTECTION FUNDAMENTALS

1. What is Radiation?

Radiation is energy that comes from a source and travels through any kind of material and through space. Light, radio, and microwaves are types of radiation. The kind of radiation discussed in this appendix is called *ionizing radiation* because it can produce charged particles (ions) in matter.

Ionizing radiation is produced by unstable atoms. Unstable atoms differ from stable atoms because unstable atoms have an excess of energy or mass or both. Radiation can also be produced by high voltage devices (e.g., x-ray machines).

Unstable atoms are said to be *radioactive*. In order to reach stability, these atoms give off, or emit, the excess energy or mass. These emissions are called *radiation*. The kinds of radiation are electromagnetic (like light) and particulate (i.e. mass given off with the energy of motion). Gamma radiation and x rays are examples of electromagnetic radiation. Beta and alpha radiation are examples of particulate radiation.

Interestingly, there is a "background" of natural radiation everywhere in our environment. It comes from space (i.e., cosmic rays) and from naturally occurring radioactive materials contained in the earth and in living things. Background radiation levels are typically 5 to 10 $\mu\text{R h}^{-1}$ depending on location, but may be as high as 25 $\mu\text{R h}^{-1}$.

Radiation from Various Sources

External Background Radiation	60 mrem/yr, U.S. Average
Natural K-40 Radioactivity in Body	40 mrem/yr
Air Travel Round Trip (NY- LA)	5 mrem
Chest X-ray Internal Dose	10 mrem per film
Radon in the Home	200 mrem/yr (variable)
Man-made (medical x rays, etc.)	60 mrem/yr (average)

2. Types of Radiation

The radiation one typically encounters is one of four types: alpha radiation, beta radiation, and gamma (or X) radiation.

A. Alpha Radiation

Alpha radiation is a heavy, very short range particle, and actually an ejected helium nucleus. Some characteristics of alpha radiation are:

- 1) Alpha radiation is not able to penetrate human skin.
- 2) Alpha emitting materials can be harmful to humans if the materials are inhaled, swallowed, or absorbed through open wounds.
- 3) A variety of instruments have been designed to measure alpha radiation.

Special training in the use of these instruments is essential for making accurate measurements.

- 4) A thin window Geiger-Mueller (GM) probe can detect the presence of alpha radiation.
- 5) Instruments cannot detect alpha radiation through even a thin layer of water, dust, paper, or other material, because alpha radiation is not penetrating.
- 6) Alpha radiation travels only a short distance (a few inches) in air, but is not an external hazard.
- 7) Alpha radiation is not able to penetrate clothing.

Examples of some alpha emitters: radium, radon, uranium, thorium.

B. Beta Radiation

Beta radiation is a light, short range particle, and actually an ejected electron. Some characteristics of beta radiation are:

- 1) Beta radiation may travel several feet in air and is moderately penetrating.
- 2) Beta radiation can penetrate human skin to the "germinal layer," where new skin cells are produced. If high levels of beta emitting contaminants are allowed to remain on the skin for a prolonged period of time, they may cause skin injury.
- 3) Beta emitting contaminants may be harmful if deposited internally.
- 4) Most beta emitters can be detected with a survey instrument and a thin window G-M probe (e.g., "pancake" type). Some beta emitters, however, produce very low energy, poorly penetrating, radiation, that may be difficult or impossible to detect. Examples of these difficult to detect beta emitters are hydrogen-3 (tritium), carbon-14, and sulfur-35.
- 5) Clothing provides some protection against beta radiation.

Examples of some pure beta emitters: strontium-90, carbon-14, tritium, and sulfur-35.

C. Gamma (or X) Radiation

Gamma radiation or x rays are very long range, penetrating electromagnetic radiation. Some characteristics of gamma radiation are:

- 1) Gamma radiation or x rays are able to travel many feet in air, and many inches in human tissue. It readily penetrates most materials, and is sometimes called "penetrating" radiation.

- 2) X rays are like gamma rays. X rays, too, are penetrating radiation. Sealed radioactive sources and machines that emit gamma radiation and x rays respectively constitute mainly an external hazard to humans.
- 3) Gamma radiation and x rays are electromagnetic radiation like visible light, radiowaves, and ultraviolet light. These electromagnetic radiations differ only in the amount of energy they have. Gamma rays and x rays are the most energetic of these.
- 4) Dense materials are needed for shielding from gamma radiation. Clothing provides little shielding from penetrating radiation, but will prevent contamination of the skin by these materials.
- 5) Gamma radiation is easily detected by survey meters with a sodium iodide detector probe.
- 6) Gamma radiation and/or characteristic x rays frequently accompany the emission of alpha and beta radiation during radioactive decay.

Examples of some gamma emitters are: iodine-131, cesium-137, cobalt-60, radium-226, technetium-99m.

3 How is Radiation Measured?

In the United States, radiation dose or exposure is often measured in the older units called rad, rem, or roentgen (R). For practical purposes with gamma and x rays, these units of measure for exposure or dose are considered equal.

Smaller fractions of these measured quantities often have a prefix, such as, milli (m) means 1/1000. For example, 1 rad = 1,000 mrad. Micro (μ) means 1/1,000,000. So, 1,000,000 μ rad = 1 rad, or 10 μ R = 0.000010 R.

The "System International" of units (SI system) for radiation measurement is now the official system of measurement, and uses the "gray" (Gy) and "sievert" (Sv) for absorbed dose and equivalent dose respectively.

1 Gy = 100 rad
 1 mGy = 100 mrad
 1 Sv = 100 rem
 1 mSv = 100 mrem

With radiation counting systems, radioactive transformation events can be measured in units of "disintegrations per minute" (dpm) and because instruments are not 100% efficient, "counts per minute" (cpm). Background radiation levels are typically less than 10 μ R h⁻¹, but due to differences in detector size and efficiency, the cpm reading on a fixed portal monitor and various hand-held survey meters will vary considerably.

4. How Much Radioactive Material is Present?

The size or weight of a quantity of material does not indicate how much radioactivity is present. A large quantity of material can contain a very small amount of radioactivity, or a very small amount of material can have a lot of radioactivity.

For example, uranium-238, with a 4.5 billion year half life, has only 0.00015 curies of activity per pound, while cobalt-60, with a 5.3 year half life, has nearly 513,000 curies of activity per pound. This "specific activity," or curies per unit mass, of a radioisotope depends on the unique radioactive half-life, and dictates the time it takes for half the radioactive atoms to decay.

In the U.S., the amount of radioactivity present is traditionally determined by estimating the number of *curies* present. The more curies present, the greater amount of radioactivity and emitted radiation.

Common fractions of the curie are the millicurie (1 mCi = 1/1000 Ci) and the microcurie (1 μ Ci = 1/1,000,000 Ci). In terms of transformations per unit time, 1 μ Ci = 2,220,000 dpm.

The System International of units (SI system) uses the unit of becquerel (Bq) as its unit of radioactivity. One curie is 37 billion Bq. Since the Bq represents such a small amount, one is likely to see a prefix noting a large multiplier used with the Bq as follows:

37 GBq = 37 billion Bq = 1 Curie
 1 MBq = 1 million Bq = ~27 microcurie
 1 GBq = 1 billion Bq = ~27 millicuries
 1 TBq = 1 trillion Bq = ~27 Curies

5. How Can You Detect Radiation?

Radiation cannot be detected by human senses. A variety of instruments are available for detecting and measuring radiation

The most common of these are:

Geiger-Mueller (G-M) Tube or Probe -- A gas-filled device that creates an electrical pulse when radiation interacts with the gas in the tube. These pulses are converted to a reading on the instrument meter. If the instrument has a speaker, the pulses also give an audible click. Common readout units are: roentgens per hour (R/hr), milliroentgens per hour (mR/hr), rem per hour (rem/hr), millirem per hour (mrem/hr) and counts per minute (cpm). G-M probes (e.g., "pancake" type) are most often used with hand-held radiation survey instruments.

Sodium Iodide Detector -- A solid crystal of sodium iodide creates a pulse of light when radiation interacts with it. This pulse of light is converted to an electrical signal, which gives a reading on the instrument meter. If the instrument has a speaker, the pulses also give an audible click. Common readout units are: microroentgens per hour (μ R/hr), and

counts per minute (cpm). Sodium iodide detectors are often used with hand-held instruments and large stationary radiation monitors. Special plastic "scintillator" materials are also used in place of sodium iodide.

(Note: For practical purposes, consider the rad, roentgen, and the rem to be equal with gamma or x rays. So, 1 mR/hr is equivalent to 1 mrem/hr.)

6. How Can You Keep Radiation Exposure Low?

Although some radiation exposure is natural in our environment, it is desirable to keep radiation exposure as low as reasonably achievable (ALARA) in an occupational setting. This is accomplished by the techniques of time, distance, and shielding.

Time: The shorter the time in a radiation field, the less the radiation exposure you will receive. Work quickly and efficiently. Plan your work before entering the radiation field.

Distance: The farther a person is from a source of radiation, the lower the radiation dose. Levels decrease by a factor of the square of the distance. Do not touch radioactive materials. Use shovels, or remote handling devices, etc., to move materials to avoid physical contact.

Shielding: Shielding behind a massive object (such as a truck, dumpster, or pile of dirt) provides a barrier that can reduce radiation exposure.

7. What is Radioactive Contamination?

If radioactive material is not in a sealed source container, it might be spread onto other objects. Contamination occurs when material that contains radioactive atoms is deposited on materials, skin, clothing, or any place where it is not desired. It is important to remember that radiation does not spread or get "on" or "in" people; rather, it is radioactive *contamination* that can be spread. A person contaminated with radioactive material will receive radiation exposure until the source of radiation (the radioactive material) is removed.

-- A person is *externally* contaminated if radioactive material is on the skin or clothing.

-- A person is *internally* contaminated if radioactive material is breathed in, swallowed, or absorbed through wounds.

-- The *environment* is contaminated if radioactive material is spread about or is unconfined.

8. How Can You Work Safely Around Radiation or Contamination?

You can work safely around radiation and/or contamination by following a few simple precautions:

- A. Use time, distance and shielding to reduce exposure. B. Avoid contact with the contamination.
- C. Wear protective clothing that if contaminated, can be removed.
- D. Wash with non-abrasive soap and water any part of the body that may have come in contact with the contamination.
- E. Assume that all materials, equipment, and personnel that came in contact with the contamination are contaminated. Radiological monitoring is recommended before leaving the scene.

9. Is it Safe to be Around Sources of Radiation?

A single high-level radiation exposure (i.e., greater than 10,000 mrem) delivered over a very short period of time may have potential health risks. From follow-up of the atomic bomb survivors, we know acutely delivered very high radiation doses can increase the occurrence of certain kinds of disease (e.g., cancer) and possibly negative genetic effects. To protect the public, radiation workers (and environment) from the potential effects of chronic low-level exposure (i.e., less than 10,000 mrem), the current radiation safety practice is to prudently assume similar adverse effects are possible with low-level protracted exposure to radiation. Thus, the risks associated with low-level medical, occupational and environmental radiation exposure are conservatively calculated to be proportional to those observed with high-level exposure. These calculated risks are compared to other known occupational and environmental hazards, and appropriate safety standards have been established by international and national radiation protection organizations (e.g., ICRP and NCRP) to control and limit potential harmful radiation effects.

Annual Radiation Dose Limits- TEDE

Facility staff -	5,000 mrem	(considered as "occupationally" exposed)
Facility staff -	100 mrem	(if considered member of the "public")
Vehicle driver -	100 mrem	(considered member of the public)
General Public -	4 mrem	(for the drinking water pathway)
General Public -	10 mrem	(for the air pathway)
General Public -	25 mrem	(all pathways combined)

Both public and occupational dose limits are set by federal (i.e., EPA and NRC) and state agencies (i.e., DEP) to limit cancer risk.

(Note: It is important to remember when dealing with radiation sources in other materials or waste that there may be chemical or biological hazards separate and distinct from the radiation hazard. These chemical or biological hazards are often more dangerous to humans than the radiation hazard.)

DEP Northcentral Regional Office

AFFIDAVIT OF PATRICK BRENNAN

I, Patrick Brennan, do hereby say, verify, and attest to the following as true and accurate to the best of my knowledge, information and belief, under penalty of perjury and subject to the penalties of 18 Pa. C.S. § 4904 relating to unsworn falsification to authorities:

1. I have been an employee of the Pennsylvania Department of Environmental Protection (DEP) for 23 years.

2. I currently serve as the Environmental Program Manager, (EPM), of DEP's Northcentral Regional Office's (NCRO) Waste Management Program, in Williamsport, Pennsylvania. The Waste Management Program covers the Northcentral Region of the Commonwealth of Pennsylvania. I have served in this position for the past 5 years and 5 months.

3. In this position, I have responsibilities to review RTKL requests that pertain to this region's Waste Management program.

4. One of my responsibilities includes reviewing searches for records in the possession, custody, or control of the NCRO's Waste Management Program that are responsive to Right-to-Know Law (RTKL) requests.

5. I have personally reviewed and I am aware of the RTKL request submitted on February 1, 2016, by Kendra L. Smith (Smith), seeking the following records for Core Laboratories d/b/a ProTechnics, Division of Core Laboratories, LP located at the Yeager Drill Site, McAdams Road, Washington, Pennsylvania:

- Any and all approvals, permits, licenses/licensures, applications for permits and/or licenses, reciprocity letters, reciprocity licenses, reciprocity agreements and/or reciprocity arrangements, including, but not limited to all licenses issued by the Department to Core Laboratories d/b/a Protechnics, Division of Core Laboratories, LP (hereinafter, "Protechnics") for use, storage and possession of radioactive materials and/or other licensed material. Additionally, this request

Affidavit of Patrick Brennan

seeks any and all investigation reports, Notices of Violation(s), Consent Order and Agreement(s) issued to Protechnics by the Department and/or between Protechnics and the Department for any and all work or services performed by Protechnics at any natural gas well site in the Commonwealth of Pennsylvania. Included in this request is a request for copies of all Notices of Violation issued by the Department to Protechnics, including but not limited to Notices of Violation dated June 15, 2010, January 28, 2010, November 26, 2013, September 13, 2013 and October 14, 2013, Violation Numbers 677913, 677915, 677914, 682834, 682833, 682829, 682835 and all corresponding inspection reports, field notes and other related writings. Further, this request seeks any and all Consent Order and Agreements between the Department and Protechnics, including, but not limited to, Consent Orders and Agreements dated November 2, 2013 and November 2, 2010.

- Copies of all enforcement activity taken by the Department against Protechnics, including but not limited to Enforcement ID Numbers 305057, 259202 and 263973, as well as all inspection reports completed by the Department regarding Protechnics, including, but not limited to, Inspection ID Numbers 1891418, 1919964, 2147772, 2204156 and 2221258.
- Any and all Radioactive Tracer Well Site Agreements made between Protechnics and any well site operator(s) for each and every well traced in the Commonwealth of Pennsylvania that is or was submitted to the Department, including, but not limited to, the April 7, 2013, Radioactive Tracer Well Site Agreement between Protechnics and a well operator.
- Any and all notifications submitted to the Department by Protechnics or the associated operator or subcontractor regarding Protechnics confirmation that licensed material, including, but not limited to, radioactive material, was returned to the surface at any well site in which Protechnics operated/performed work or services in the Commonwealth of Pennsylvania.
- Any and all documents, correspondence, e-mails and any other communication(s) between Protechnics and the Department and/or Range Resources and the Department regarding Protechnics and any and all work/services performed in the Commonwealth of Pennsylvania by Protechnics.
- Any and all MSDS/SDS (material data safety sheets and safety data sheets) in the possession of the Department regarding any and all products utilized by Protechnics at any well site in Pennsylvania, including, but not limited to, all MSDS/SDS for Protechnics Radioactive Tracer Products, as well as any and all Chemical Frac Tracer ("CFT") products, including, but not limited to, CFT 1000, CFT 1100, CFT 1200, CFT 1300, CFT 2000, CFT 2100, CFT 1900, CFT 1700.

Affidavit of Patrick Brennan

6. I am also familiar with the February 3, 2016, amendment to the Smith request which sought "all drill sites in the Commonwealth including but not limited to the Yeager Drill."

7. This request was assigned to multiple DEP Regional Offices including the NCRO. NCRO's RTKL tracking number for its response was 4400-16-010.

8. In consultation with staff in the NCRO's Waste Management Program, a search was conducted for responsive records. The scope of the search included checking files within the NCRO's file room, staff offices, and electronically stored information. The search also included discussions with appropriate NCRO staff.

9. The NCRO's Waste Management Program initially did not locate any records responsive to Smith's request and does not maintain a file for ProTechnics.

10. As part of preparing a response to Smith's OOR appeal, the NCRO, in an abundance of caution, repeated its search for records. During its second search, a limited number of records were located. With the exception of one inspection report, these records were copies not generated by the NCRO's Waste Management Program. All of the records, including the inspection report generated by this region, were accounted for by the Southcentral Regional Office, (SCRO), Central Office, (CO), and Northwest Regional Office (NWRO) in their final responses to Smith's RTK request as well as in their affidavits and privilege logs in response to Smith's OOR appeal.

11. The NCRO's Waste Management program conducted an inspection at a well site where waste originating at that site had been transported to the McKean County landfill, in the northwest portion of the Commonwealth. Gustafson Affidavit.

12. The waste which set off radiation alarms at the landfill was determined not to be acceptable waste and was removed and returned to the generator well site.

Affidavit of Patrick Brennan

13. The inspection report is not a public document because it reveals the specific type of radioactive material contained in the waste, the method of disposal, and the exact location of the radioactive material, including GPS coordinates, and the well permit number. Forney Affidavit, paragraphs 54-56.

14. Five pages of email records in the possession of the Waste Management Program were withheld because they contain sensitive information relating to radioactive materials, in particular radioactive tracers, and discuss the following: radioactive material isotope types; radioactive material quantities, and storage of the radioactive material, licensee's name and license number; locations of radioactive materials; names, addresses, and phone numbers for responsible officials; and contact name at the site.

15. These email records also contain the internal, predecisional discussions of proposed enforcement actions and program coordination in response to these issues. The emails are amongst DEP personnel only, did not include ProTechnics or any other third-party as reflected in NCRO's privilege log, and contain no final decisions of DEP.

16. These emails were also withheld because they contain personal identification information, specifically the internal telephone numbers of Department employees. The internal telephone numbers are unique to the named DEP employee and assigned to them by the Commonwealth for their use. It is a secondary number.

17. The Department's Bureau of Radiation Protection, its Divisions and Regional Offices provide other general telephone numbers to the public to use when contacting their

Affidavit of Patrick Brennan

offices. Those phone numbers are not assigned to individual employees and were not treated as personal identification information for purposes of the Department's response.¹

18. A copy of a three page Radioactive Materials License was withheld because it contains security related information regarding the source, physical form of the nuclear material and the way in which it may be used, and license number.

19. I have reviewed the affidavit of David J. Allard, CHP, DEP's Director of the Bureau of Radiation that was prepared in response to this OOR appeal. Allard throughout his affidavit notes the multitude of public health, safety, and security concerns regarding the public release of information pertaining to radioactive materials. Allard's affidavit is incorporated by reference into this affidavit.

20. For the reasons outlined in the Allard affidavit, disclosure of the records in the possession of the NC Regional Office's Waste Management Program would risk public health, safety, and security. Therefore, the NC Regional Office withheld those records consistent with Allard's affidavit and as identified within the NC Regional Office's privilege log.

21. For any records not provided, or not accounted for in the NCRO's privilege log, no other records exist in the custody, control, or possession of the NCRO's Waste Management Program.

22. Based upon my consultation with staff and my personal search for records, the NCRO's Waste Management Program does not possess any other responsive records in its custody or control responsive to Smith's request other than those identified in this affidavit and

¹ General office telephones for the Bureau of Radiation Protection, its Divisions and Regional Offices, are available at:
<http://www.dep.pa.gov/Business/RadiationProtection/Pages/Contacts.aspx#.VvE6CxxD8uQ>

Affidavit of Patrick Brennan

which were identified and either provided or excepted from disclosure by the SCRO, CO, or NWRO.


Patrick Brennan

4-18-16
Date

AFFIDAVIT OF JENNIFER MEANS

I, Jennifer Means, do hereby say, verify and attest to the following as true and accurate to the best of my knowledge, information and belief, under penalty of perjury and subject to the penalties of 18 Pa. C.S. § 4904 relating to unsworn falsification to authorities:

1. I have worked for the Pennsylvania Department of Environmental Protection (DEP) for 23 years and 6 months.

2. I currently serve as the Program Manager of DEP's Oil and Gas Management Program in the DEP's Northcentral Regional Office (NCRO), which covers the Eastern Oil and Gas District of the Commonwealth of Pennsylvania and is located in Williamsport, Pennsylvania. I have served in this position for the past 7 years and 2 months.

3. In this position, I have responsibilities to review RTKL requests that pertain to this regions Oil and Gas program.

4. One of my responsibilities includes reviewing searches for records in the possession, custody, or control of the NCRO's Eastern District Oil and Gas Program that are responsive to Right-to-Know Law (RTKL) requests.

5. I have personally reviewed and I am aware of the RTKL request submitted on February 1, 2016, by Kendra L. Smith (Smith), seeking the following records for Core Laboratories d/b/a ProTechnics, Division of Core Laboratories, LP located at the Yeager Drill Site, McAdams Road, Washington, Pennsylvania:

- Any and all approvals, permits, licenses/licensures, applications for permits and/or licenses, reciprocity letters, reciprocity licenses, reciprocity agreements and/or reciprocity arrangements, including, but not limited to all licenses issued by the Department to Core Laboratories d/b/a Protechnics, Division of Core Laboratories, LP (hereinafter, "Protechnics") for use, storage and possession of radioactive materials and/or other licensed material. Additionally, this request

Affidavit of Jennifer Means

seeks any and all investigation reports, Notices of Violation(s), Consent Order and Agreement(s) issued to Protechnics by the Department and/or between Protechnics and the Department for any and all work or services performed by Protechnics at any natural gas well site in the Commonwealth of Pennsylvania. Included in this request is a request for copies of all Notices of Violation issued by the Department to Protechnics, including but not limited to Notices of Violation dated June 15, 2010, January 28, 2010, November 26, 2013, September 13, 2013 and October 14, 2013, Violation Numbers 677913, 677915, 677914, 682834, 682833, 682829, 682835 and all corresponding inspection reports, field notes and other related writings. Further, this request seeks any and all Consent Order and Agreements between the Department and Protechnics, including, but not limited to, Consent Orders and Agreements dated November 2, 2013 and November 2, 2010.

- Copies of all enforcement activity taken by the Department against Protechnics, including but not limited to Enforcement ID Numbers 305057, 259202 and 263973, as well as all inspection reports completed by the Department regarding Protechnics, including, but not limited to, Inspection ID Numbers 1891418, 1919964, 2147772, 2204156 and 2221258.
- Any and all Radioactive Tracer Well Site Agreements made between Protechnics and any well site operator(s) for each and every well traced in the Commonwealth of Pennsylvania that is or was submitted to the Department, including, but not limited to, the April 7, 2013, Radioactive Tracer Well Site Agreement between Protechnics and a well operator.
- Any and all notifications submitted to the Department by Protechnics or the associated operator or subcontractor regarding Protechnics confirmation that licensed material, including, but not limited to, radioactive material, was returned to the surface at any well site in which Protechnics operated/performed work or services in the Commonwealth of Pennsylvania.
- Any and all documents, correspondence, e-mails and any other communication(s) between Protechnics and the Department and/or Range Resources and the Department regarding Protechnics and any and all work/services performed in the Commonwealth of Pennsylvania by Protechnics.
- Any and all MSDS/SDS (material data safety sheets and safety data sheets) in the possession of the Department regarding any and all products utilized by Protechnics at any well site in Pennsylvania, including, but not limited to, all MSDS/SDS for Protechnics Radioactive Tracer Products, as well as any and all Chemical Frac Tracer ("CFT") products, including, but not limited to, CFT 1000, CFT 1100, CFT 1200, CFT 1300, CFT 2000, CFT 2100, CFT 1900, CFT 1700.

Affidavit of Jennifer Means

6. I am also familiar with the February 3, 2016, amendment to the Smith request which sought "all drill sites in the Commonwealth including but not limited to the Yeager Drill."

7. This request was assigned to multiple DEP Regional Offices including the NCRO. NCRO's RTKL tracking number for its response was 4400-16-010.

8. In consultation with staff in the NCRO's Eastern District Oil and Gas Program, a thorough search was conducted for responsive records. The scope of the search included checking files within the NCRO's file room, staff offices, and electronically stored information. The search also included discussions with appropriate NCRO staff.

9. The NCRO Eastern District Oil and Gas Program's search resulted in locating an NOV where ProTechnics was named as being contracted by Citrus Energy Corporation to conduct a radioactive tracer study. However, the NOV was issued solely to Citrus Energy Corporation; it was not issued to ProTechnics. This record was issued by the Southcentral Regional Office (SCRO) and only a copy was located in the NCRO.

10. On February 29, 2016, a redacted copy of the NOV issued by DEP to Citrus Energy Corporation was provided to Smith in response to her RTKL request. Internal emails related to that specific NOV were withheld as exempt records. NCRO's final letter is incorporated as Attachment A.

11. Smith's request specifically sought "any and all investigation reports, Notices of Violation(s), Consent Order and Agreement(s) issued to Protechnics by the PA DEP and/or between Protechnics and the PA DEP...." The copy of the NOV issued to Citrus Energy by the SCRO was not issued to ProTechnics and was therefore deemed not to be responsive to Smith's request. Forney Affidavit, paragraph 96.

Affidavit of Jennifer Means

12. On March 24, 2016, a corrective letter was sent to Smith indicating that the records originally thought to be responsive to her request, on closer examination, were not. As stated, the redacted NOV that was provided to her was issued to Citrus Energy Corporation exclusively and not to ProTechnics. The internal emails withheld were solely related to Citrus Energy Corporation's NOV. Therefore, those records were not responsive to Smith's request. NCRO's corrective letter is incorporated as Attachment B.

13. As part of preparing a response to Smith's OOR appeal, the NCRO, in an abundance of caution, repeated its search for records. During its second search, in addition to those records identified in paragraph 9 and 10 above, a limited number of records were located. However, these records were copies not generated by the NCRO's Eastern District Oil and Gas Program, but records that were accounted for by the SCRO, and Central Office (CO) in their final responses to Smith's RTK request, as well as in their affidavits and privilege logs in response to Smith's OOR appeal.

14. The email records in the possession of NCRO's Eastern District Oil and Gas Program were withheld because they contain sensitive information relating to radioactive materials, in particular radioactive tracers, and internal discussions regarding incidents involving radioactive material, preparation for a meeting with ProTechnics to discuss these issues, and post meeting discussions.

15. These email records also contain the internal, predecisional discussions of proposed enforcement actions and program coordination in response to these issues. The emails are amongst DEP personnel only, did not include ProTechnics or any other third-party as reflected in NCRO's privilege log, and contain no final decisions of DEP.

Affidavit of Jennifer Means

17. The email chain from December 24, 2009, to December 28, 2009, were part of DEP's noncriminal investigation into an incident involving the disposal of radioactive waste. These records exist and were solely created because of DEP's investigations into ProTechnics activities.

18. These emails were also withheld because they contain personal identification information, specifically the internal telephone numbers of Department employees. The internal telephone numbers are unique to the named DEP employee and assigned to them by the Commonwealth for their use. It is a secondary number.

19. The Department's Bureau of Radiation Protection, its Divisions and Regional Offices provide other general telephone numbers to the public to use when contacting their offices. Those phone numbers are not assigned to individual employees and were not treated as personal identification information for purposes of the Department's response.¹

20. The copy of the November 2, 2010, COA and its attachments are identified as containing Confidential Proprietary Information, (CPI), or Trade Secrets. For the reasons stated in the Forney Affidavit, paragraphs 135 – 142, these records were disclosed in redacted form by the SCRO.

21. I have reviewed the affidavit of David J. Allard, CHP, DEP's Director of the Bureau of Radiation that was prepared in response to this OOR appeal. Allard throughout his affidavit notes the multitude of public health, safety, and security concerns regarding the public release of information pertaining to radioactive materials. Allard's affidavit is incorporated by reference into this affidavit.

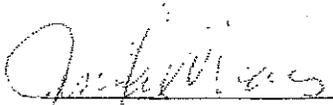
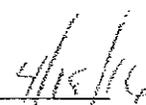
¹ General office telephones for the Bureau of Radiation Protection, its Divisions and Regional Offices, are available at:
<http://www.dep.pa.gov/Business/RadiationProtection/Pages/Contacts.aspx#.VvE6CxzD8uQ>

Affidavit of Jennifer Means

22. For the reasons outlined in the Allard affidavit, disclosure of the records in the possession of the NCRO covering the Eastern Oil and Gas District would risk public health, safety, and security. Therefore, the NCRO withheld those records consistent with Allard's affidavit and as identified within the NCRO's privilege log.

23. For any records not provided, or not accounted for in the NCRO's privilege log, no other records exist in the custody, control, or possession of NCRO's Eastern District Oil and Gas Program.

24. Based upon my consultation with staff and my personal search for records, the NCRO Eastern District Oil and Gas Program does not possess any other responsive records in its custody or control responsive to Smith's request other than those identified in this affidavit and which were identified and either provided or excepted from disclosure by the SCRO or CO.


Jennifer Means

Date



pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

March 9, 2016

Certified Mail Number 7014 1820 0002 3638 0353

Kendra L. Smith, Esquire
Smith Butz, LLC
125 Technology Drive, Suite 202, Bailey Center 1
Canonsburg, PA 15317

Re: Right-to-Know Request Numbers: 1400-16-071 (CO), 4100-16-0027 (SE), 4200-16-023 (NE), 4300-16-019 (SC), 4400-16-010 (NC), 4500-16-018 (SW), 4600-16-029 (NW)

Dear Attorney Smith:

On February 1, 2016, the open-records officer of the Department of Environmental Protection (Department) received your written request for records and assigned it the tracking numbers listed above. The subject of your request required its assignment to the Department's Central Office (CO) and the Southeast (SE), Northeast (NE), Southcentral (SC), Northcentral (NC), Southwest (SW), and Northwest (NW) Regional Offices. The Department's NC Regional Office is responding on behalf of itself under the Pennsylvania Right-to-Know Law, 65 P.S. §§ 67.101-67.3104 (RTKL). You will receive final correspondence from the other offices under separate cover.

You requested the following records for Core Laboratories d/b/a Protechnics, Division of Core Laboratories, LP, located at the Yeager Drill Site, McAdams Road, Washington, Pennsylvania:

- Any and all approvals, permits, licenses/licensures, applications for permits and/or licenses, reciprocity letters, reciprocity licenses, reciprocity agreements and/or reciprocity arrangements, including, but not limited to all licenses issued by the Department to Core Laboratories d/b/a Protechnics, Division of Core Laboratories, LP (hereinafter, "Protechnics") for use, storage and possession of radioactive materials and/or other licensed material. Additionally, this request seeks any and all investigation reports, Notices of Violation(s), Consent Order and Agreement(s) issued to Protechnics by the Department and/or between Protechnics and the Department for any and all work or services performed by Protechnics at any natural gas well site in the Commonwealth of Pennsylvania. Included in this request is a request for copies of all Notices of Violation issued by the Department to Protechnics, including but not limited to Notices of Violation dated June 15, 2010, January 28, 2010, November 26, 2013, September 13, 2013, and October 14, 2013, Violation Numbers 677913, 677915, 677914, 682834, 682833, 682829, 682835 and all corresponding inspection reports, field notes and other related writings. Further, this request seeks any and all Consent Order and Agreements between the Department and Protechnics, including, but not limited to, Consent Orders and Agreements dated November 2, 2013, and November 2, 2010.

Northcentral Regional Office
208 West Third Street, Suite 101 | Williamsport, PA 17701-6448 | 570.327.3695 | F 570.327.3565
www.depweb.state.pa.us

Attachment
A

- Copies of all enforcement activity taken by the Department against Protechnics, including but not limited to Enforcement ID Numbers 305057, 259202 and 263973, as well as all inspection reports completed by the Department regarding Protechnics, including, but not limited to, Inspection ID Numbers 1891418, 1919964, 2147772, 2204156 and 2221258.
- Any and all Radioactive Tracer Well Site Agreements made between Protechnics and any well site operator(s) for each and every well traced in the Commonwealth of Pennsylvania that is or was submitted to the Department, including, but not limited to, the April 7, 2013, Radioactive Tracer Well Site Agreement between Protechnics and a well operator.
- Any and all notifications submitted to the Department by Protechnics or the associated operator or subcontractor regarding Protechnics confirmation that licensed material, including, but not limited to, radioactive material, was returned to the surface at any well site in which Protechnics operated/performed work or services in the Commonwealth of Pennsylvania.
- Any and all documents, correspondence, e-mails and any other communication(s) between Protechnics and the Department and/or Range Resources and the Department regarding Protechnics and any and all work/services performed in the Commonwealth of Pennsylvania by Protechnics.
- Any and all MSDS/SDS (material data safety sheets and safety data sheets) in the possession of the Department regarding any and all products utilized by Protechnics at any well site in Pennsylvania, including, but not limited to, all MSDS/SDS for Protechnics Radioactive Tracer Products, as well as any and all Chemical Frac Tracer ("CFT") products, including, but not limited to, CFT 1000, CFT 1100, CFT 1200, CFT 1300, CFT 2000, CFT 2100, CFT 1900, CFT 1700.

By your email on February 3, 2016, to Department Legal Counsel, Edward Stokan, of the Department's SW Regional Office, you amended your RTKL request to the following:

- All drill sites in the Commonwealth, including but not limited to the Yeager Drill site as indicated in attachment 1 of the original request.

An initial response to your request was due on or before February 8, 2016. On that date, you were notified you that the Department required an additional thirty days, until March 9, 2016, to respond to your request.

Your request is granted in part and denied in part with respect to records located in the Department's NC Regional Office. The records enclosed with this response consist of a two page Notice of Violation, (NOV), which has been redacted for the reasons that follow. No fee has been charged in accordance with agency policy, as our fee waiver applies due to the small number of records produced.

However, your request is denied in part, and some produced records were redacted. The Department redacted portions of the January 28, 2010, NOV.

Additionally, ten emails and an NOV Response dated February 8, 2010, are being withheld for the following legally permissible reasons:

Public Safety and Security. Records containing information about radioactive materials cannot be released to the public for public safety and security reasons. A radioactive materials license, related complaint, incident report, inspection report, and any notice of violation regarding radioactive materials is exempt from disclosure under multiple provisions of the RTKL. Disclosing the contents of these records would reveal specific information pertaining to the nature and location of radioactive materials.

Pursuant to Section 708(b)(2) of the RTKL, 65 P.S. § 67.708(b)(2), a record is exempt from access by a requester if the record is "maintained by an agency in connection with the military, homeland security, national defense, law enforcement or other public safety activity that if disclosed would be reasonably likely to jeopardize or threaten public safety or preparedness or public protection activity"

Furthermore, Section 708(b)(3) of the RTKL, 65 P.S. § 67.708(b)(3), provides that a record is exempt from access by a requester if disclosure of the record "creates a reasonable likelihood of endangering the safety or the physical security of a building, public utility, resource, [or] infrastructure"

The disclosure of a license's contents, incident report, and any inspection report could reasonably lead to public safety risks. The license and reports provide detailed information about the specific location and the security measures taken to protect radioactive materials. Moreover, radioactive materials files generally contain information identifying radioactive source possessed, the quantity or type of source, activity of the source, location of the source, identity of individuals authorized to have access to or use of the source, and similar sensitive information. Information contained within these files would give a determined adversary the means to actually do harm to others.

An individual could utilize the information in the license and reports to unlawfully obtain the radioactive materials for illicit purposes thus creating a major security and health breach. If an individual with criminal intent obtained these materials or should an individual re-publish the information contained within a license and reports which was subsequently obtained by someone with criminal intent, the public's health and safety could be severely compromised.

The NC Regional Office has redacted an NOV and withheld 12 pages of records that would otherwise be responsive to your request. The information of concern within these records specifically includes the license number, licensees' names, physical addresses, employee identities or information, types of sources, quantities of sources, locations of sources, names of authorized users, contact names at the site, inspection reports, Department staff who have knowledge of the sources, and documentation of security controls implemented at the site to prevent unauthorized access to the sources.

Noncriminal Investigation. To the extent that your request for records relates to the Department's non-criminal investigations, it is denied. The noncriminal investigation exceptions of 65 P.S. §§ 708(b)(17)(i) and(ii) exempts from disclosure: (i) Complaints submitted to an agency; and (ii) investigative materials, notes, correspondence and reports. Section 708(b)(17)(vi)(A) through (E) further exempts records, that, if disclosed, would do one or more of the following:

- (A) Reveal the institution, progress or result of an agency investigation, except the imposition of a fine or civil penalty, the suspension, modification or revocation of a license, permit, registration, certification or similar authorization issued by an agency or an executed settlement agreement unless the agreement is determined to be confidential by a court.
- (B) Deprive a person of the right to an impartial adjudication.
- (C) Constitute an unwarranted invasion of privacy.
- (D) Hinder an agency's ability to secure an administrative or civil sanction.
- (E) Endanger the life or physical safety of an individual.

65 P.S. §§ 67.708(b)(17)(vi)(A-E).

Section 305(a) of the Radiation Protection Act states:

The department or its duly authorized representatives shall have the power to enter at all reasonable times with sufficient probable cause upon any public or private property, building, premise or place, for the purposes of determining compliance with this act, any license conditions or any rules, regulations or orders issued under this act. In the conduct of an investigation, the department or its duly authorized representatives shall have the authority to conduct tests,

inspections or examination of any radiation source, or of any book, record, document or other physical evidence related to the use of a radiation source.

35 P.S. § 7110.305(a).

Section 215.12 of the Radiation Regulations states:

- (a) *Maintenance of records.* Licensees and registrants shall maintain records under this article and have these records available for inspection by the Department at permanent sites or facilities of use identified in a license or registration issued under this article.
- (b) *Rights of the Department.* The Department and its agents and employees will:
 - (1) Have access to, and require the production of, books, papers, documents and other records and physical evidence pertinent to a matter under investigation.
 - (2) Require a registrant or licensee to make reports and furnish information as the Department may prescribe.
 - (3) Enter the premises of a licensee or registrant for the purpose of making an investigation or inspection of radiation sources and the premises and facilities where radiation sources are used or stored, necessary to ascertain the compliance or noncompliance with the act and this chapter and to protect health, safety and the environment.
- (c) *Inspections and investigations by the Department.* The Department, its employees and agents may conduct inspections and investigations of the facilities and regulated activities of registrants of radiation-producing machines and licensees of radioactive material necessary to demonstrate compliance with the act or this article.
- (d) *Additional inspections and investigations.* The Department, its employees and agents may conduct additional follow-up inspections and investigations if violations of the act or regulations promulgated thereunder were noted at the time of the original inspection, or if a person presents information, or circumstances arise which give the Department reason to believe that the health and safety of a person is threatened or that the act or this article are being violated."

25 Pa. Code § 215.12

To substantiate the RTKL noncriminal investigation exception at 65 P.S. § 67.708(b)(17), an agency must demonstrate that "a systematic or searching inquiry, a detailed examination, or an official probe was conducted regarding a noncriminal matter." *Sherry v. Radnor Twp. Sch. Dist.*, 20 A.3d 515 (Pa. Cmwlth. 2011), quoting *Dept. of Health v. OOR*, 4 A.3d 803 (Pa. Cmwlth. 2010) (internal quotation marks omitted). See also *O'Brien v. Pennsylvania State Police*, Dkt. AP 2011-1051. Information that is created by the Department or gathered from outside sources

and used by an agency as part of its investigation is exempt from disclosure. *John v. DEP*, OOR Dkt. AP 2011-0657; *Dept. of Health*, 4 A.3d 803, 810-11; *Coulter v. Pennsylvania Department of Public Welfare*, OOR Dkt. AP 2011-0699; *Slaby v. Northumberland County*, OOR Dkt. AP 2011-0331. *Heavens v. Pennsylvania Department of Environmental Protection*, 65 A.3d 1069 (Pa. Cmwlth. 2013).

The records that are being withheld as described above were created as a result of a probing inquiry into the Department's official noncriminal investigation into the disposal of radioactive waste related to gas drilling activity. To release these records would reveal the institution, progress, or result of the Department's investigation, 65 P.S. § 708(b)(17)(vi)(A).

Internal, Predecisional Deliberation Exception. The Department denies your request to records that reflect its predecisional, internal deliberations, because such records are exempt from production under the RTKL. 65 P.S. § 67.708(b)(10). Section 708(b)(10)(i)(A) of the RTKL states that a Commonwealth agency can withhold records that reflect, "The internal, pre-decisional deliberations of an agency, its members, employees or officials or pre-decisional deliberations between agency members, employees or officials and members, employees or officials of another agency..., contemplated or proposed policy or course of action of any research, memos or other documents used in the predecisional deliberations." 65 P.S. § 67.708(b)(10)(i)(A). According to the language of Section 708(b)(10)(i), protected records must be internal, predecisional, and deliberative. *McGowan v. Dep't of Envtl. Protection*, 103 A.3d 374 (Pa. Cmwlth. 2014).

In addition to protecting records that are internal, predecisional deliberations, Section 708(b)(10)(i)(A) also protects records that "reflect" deliberations. Although "reflect" is not expressly defined in the RTKL, it was discussed at length by the Commonwealth Court in *Office of the Governor v. Scolforo*, 65 A.3d 1095 (Pa. Cmwlth. 2013) (*en banc*) (*Scolforo*). The Court stated:

[W]e recognize that the General Assembly utilized the specific term "reflect," 65 P.S. § 67.708(b)(10) (*emphasis added*), and did not use the term "reveal." The term *reflect* means "mirror" or "show," while the term *reveal* means "to make publicly or generally known" or, in other words, "disclose." *Webster's Third New International Dictionary* 1908, 1942 (2002). Given the broad meaning of the term *reflect*, as opposed to *reveal*, and the fact that the General Assembly chose the term *reflect* when providing for the predecisional deliberative exception, we must interpret the exception as written.

Scolforo, 65 A.3d at 1101-1102.

Accordingly, the General Assembly's specific use of the word "reflect" in the internal, predecisional deliberation exception of the RTKL signifies that there is no requirement that the

deliberated course of action be detailed, set forth, or summarized in a record in order to confer this protection. 65 P.S. § 67.708(b)(10)(i)(A). A record is protected from disclosure even if it reflects the agency's deliberations.

Consequently, approximately 5 pages that consist of 10 emails are exempted from disclosure because these records are or reflect the Department's internal, predecisional deliberative records or were relied upon by the Department as part of its internal, predecisional deliberative process. The records withheld pertain to internal correspondence among Department employees reflecting the decision making process regarding enforcement actions, draft letters, draft notices of violations and meeting notes. These records are internal, prior to any final decision, and do not reflect the final determination of the Department.

Personal Identification Information. The RTKL exempts personal identification information from disclosure. 65 P.S. § 67.708(b)(6). Personal identification information includes, but is not limited to a person's Social Security number, driver's license number, personal financial information, home, cellular or personal telephone numbers, personal e-mail addresses, employee number, or other confidential personal identification number.

The NC Regional Office has withheld approximately 1 record page that would otherwise be responsive to your request. The information of concern are Department employees' internal telephone numbers. These records are the records previously accounted for and also withheld under the "regulatory preclusion" and noncriminal investigation exception contained within this response.

Section 708(b)(6)(a) of the RTKL, 65 P.S. § 67.708(b)(6)(a), lists what constitutes personal identification information. Based on the types of information listed, it clearly means information that is unique to a particular individual or which may be used to identify or isolate an individual from the general population. It is information which is specific to the individual, not shared in common with others, and which makes an individual distinguishable from another. *Delaware County v. Schaefer*, 45 A.3d 1149, 1153 (Pa. Cmwlth. 2011).

This rationale of telephone numbers being specific to an individual and thus being deemed personal extends to government-issued "personal" cellular telephones as well as assigned personal telephone extensions. The fact that government business may be discussed over an employee's government-issued personal cellular telephone does not make that telephone any less "personal" within the meaning of the RTKL. *Office of the Governor v. Raffle*, 65 A.3d 1105, 1111 (Pa. Cmwlth. 2013). Personal does not mean that it has to involve a public official's "personal affairs" but that it is personal to that official in carrying out public responsibilities. *City of Philadelphia v. Philadelphia Inquirer*, 52 A.3d 456, 461 (Pa. Cmwlth. 2012).

Both government issued telephone numbers and direct desk telephone extensions are clearly personal to that official for carrying out the duties of Commonwealth employment. The same analysis applies to government issued personal email messages. Consequently, as personal identification information, it is appropriate for the Department to withhold these records. See also *Dep't of Public Welfare v. Clofine*, 2014 WL 688127 (Pa. Cmwlth. February 20, 2014).

Kendra Smith, Esquire

8

March 9, 2016

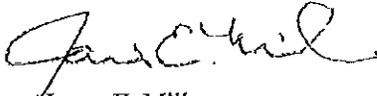
You have a right to appeal this response in writing to Executive Director, Office of Open Records, Commonwealth Keystone Building, 400 North Street, 4th Floor, Harrisburg, Pennsylvania 17120. If you choose to file an appeal you must do so within 15 business days of the mailing date of this response and send to the OOR:

- 1) all Department responses;
- 2) your request; and
- 3) the reason(s) you believe the Department erred in its response.

Also, the OOR has an appeal form available on the OOR website at:

<http://www.openrecords.pa.gov/Using-the-TKL/Pages/RTKLForms.aspx#.VpOKEBwo7X6>

Sincerely,



James E. Miller
Assistant Regional Director

Enclosure



DEP Right-to-Know Law Record Request Form

Business Hours: 8:00 am - 4:30 pm (RTK requests received after 4:30 pm are considered received the next business day)
Mail to: DEP Open Records Officer ("AORO"), DEP/BOS, PO Box 8473, Harrisburg, PA 17105-8473.
Or Fax to: 717-705-8023
Or Email to: EP-DEP-RTK@pa.gov *Request sent to any other email will not be deemed a RTKL request.
Contact: 717-787-2043

Name of Requestor (or Anonymous): Kendra L. Smith, Esq.
Name of Company (or N/A): Smith Butz, LLC
Requestor's Street Address: 125 Technology Drive, Suite 202, Bailey Center I
Requestor's City/State/Zip Code: Canonsburg, PA 15317
Requestor's Telephone Number: (724) 745-5121
Requestor's Email Address: ksmith@smithbutzlaw.com

Records being requested (please sufficiently describe the record(s) requested so that they are identifiable to Department staff.):

Core Laboratories d/b/a Protechnics, Division of Core Laboratories, LP
 Name of Individual / Company for records being requested (including former names)

Yeager Drill Site

Facility Name for requested records (if different than Company Name)

McAdams Road, Washington, PA 15301
 Street Address (including zip code)

Washington
 County(ies)

Amwell
 Municipality(ies)

Additional information to assist with search and retrieval of responsive records (e.g. permit no.(s); dates or timeframe of records requested; programs of interest, geographic area):

Please see, "Attachment 1," attached hereto.

FORM OF RECORD PRODUCTION – check appropriate response:

REQUESTING FILE REVIEW ACCESS:
 Seeking access, review and self copying of records is at a reduced cost of \$.15 per page. YES NO

REQUESTING DUPLICATION AND MAILING RECORDS:
 Agency copying of records is at a cost of \$.25 per page YES NO

REQUESTING CERTIFICATION OF RECORDS:
 I WANT DEP TO CERTIFY RECORDS (AT A COST OF \$5.00 PER REQUEST): YES

PENNSYLVANIA – OFFICE OF OPEN RECORDS
RIGHT-TO-KNOW REQUEST

“ATTACHMENT 1”

Any and all approvals, permits, licenses/licensures, applications for permits and/or licenses, reciprocity letters, reciprocity licenses, reciprocity agreements and/or reciprocity arrangements, including, but not limited to all licenses issued by the Pennsylvania Department of Environmental Protection (“PA DEP”) to Core Laboratories d/b/a Protechnics, Division of Core Laboratories, LP (hereinafter, “Protechnics”) for use, storage and possession of radioactive materials and/or other licensed material. Additionally, this request seeks any and all investigation reports, Notices of Violation(s), Consent Order and Agreement(s) issued to Protechnics by the PA DEP and/or between Protechnics and the PA DEP for any and all work or services performed by Protechnics at any natural gas well site in the Commonwealth of Pennsylvania. Included in this request is a request for copies of all Notices of Violation issued by the PA DEP to Protechnics, including but not limited to Notices of Violation dated 06/15/10, 01/28/10, 11/26/13, 09/13/13 and 10/14/13, Violation Numbers 677913, 677915, 677914, 682834, 682833, 682829, 682835 and all corresponding inspection reports, field notes and other related writings. Further, this request seeks any and all Consent Order and Agreements between the PA DEP and Protechnics, including, but not limited to, Consent Orders and Agreements dated November 2, 2013 and November 2, 2010.

Additionally, this request includes a request for copies of all enforcement activity taken by the PA DEP against Protechnics, including but not limited to Enforcement ID Number 305057, 259202 and 263973, as well as all inspection reports completed by the PA DEP regarding Protechnics, including, but not limited to, Inspection ID Numbers 1891418, 1919964, 2147772, 2204156 and 2221258.

This request further seeks any and all Radioactive Tracer Well Site Agreements made between Protechnics and any well site operator(s) for each and every well traced in the Commonwealth of Pennsylvania that is or was submitted to the PA DEP, including, but not limited to, the April 7, 2013 Radioactive Tracer Well Site Agreement between Protechnics and a well operator.

In addition to the above, this request seeks any and all notifications submitted to the PA DEP by Protechnics or the associated operator or subcontractor regarding Protechnics confirmation that licensed material, including, but not limited to, radioactive material, was returned to the surface at any well site in which Protechnics operated/performed work or services in the Commonwealth of Pennsylvania.

Additionally, this request seeks any and all documents, correspondence, e-mails and any other communication(s) between Protechnics and the PA DEP and/or Range Resources and the PA DEP regarding Protechnics and any and all work/services performed in the Commonwealth of Pennsylvania by Protechnics.

Further, this request seeks any and all MSDS/SDS (material data safety sheets and safety data sheets) in the possession of the PA DEP regarding any and all products utilized by Protechnics at

any well site in Pennsylvania, including, but not limited to, all MSDS/SDS for Protechnics Radioactive Tracer Products, as well as any and all Chemical Frac Tracer ("CFT") products, including, but not limited to, CFT 1000, CFT 1100, CFT 1200, CFT 1300, CFT 2000, CFT 2100, CFT 1900, CFT 1700.

From: Kendra L. Smith [mailto:klsmith@smithbutzlaw.com]
Sent: Wednesday, February 03, 2016 2:50 PM
To: Stokan, Edward
Subject: RE: February 1, 2016 RTKL Request re ProTechnics

It is for all drill sites in the Commonwealth including but not limited to the Yeager Drill site as indicated in attachment 1. Thank you.

Kendra L. Smith, Esq.
Smith Butz, LLC
Attorneys at Law
125 Technology Drive, Suite 202
Bailey Center I, Southpointe
Canonsburg, PA 15317
Phone: (724) 745-5121
Fax: (724) 745-5125
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Web: www.smithbutzlaw.com

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----- Original Message -----

Subject: February 1, 2016 RTKL Request re ProTechnics
From: "Stokan, Edward" <estokan@pa.gov>
Date: Wed, February 03, 2016 2:46 pm
To: "klsmith@smithbutzlaw.com" <klsmith@smithbutzlaw.com>

Your February 1, 2016 Right-to-Know Law request indicates that the "Facility name for requested records" is the "Yeager Drill Site."

However, your Attachment 1 indicates that you are seeking responsive records as to any natural gas well site in the Commonwealth.

Can you please confirm whether you seek records pertaining only to the Yeager Drill Site or pertaining to all gas well sites throughout the Commonwealth?

Edward S. Stokan | Assistant Counsel
Department of Environmental Protection | Office of Chief Counsel
Southwest Regional Office
400 Waterfront Drive | Pittsburgh, PA 15222.
Phone: 412.442.4262 | Direct Phone: 412.442.4249 | Fax: 412.442.4274
www.depweb.state.pa.us

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ATTORNEY WORK PRODUCT

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pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

March 24, 2016

Certified Mail Number 7014 1820 0002 3638 0391

Kendra L. Smith, Esquire
Smith Butz, LLC
125 Technology Drive, Suite 202, Bailey Center 1
Canonsburg, PA 15317

Re: Right-to-Know Request Numbers: 1400-16-071 (CO), 4100-16-0027 (SB), 4200-16-023 (NE), 4300-16-019 (SC), 4400-16-010 (NC), 4500-16-018 (SW), 4600-16-029 (NW)

Dear Attorney Smith:

On February 1, 2016, the open-records officer of the Department of Environmental Protection (Department) received your written request for records and assigned it the tracking numbers listed above. On March 9, 2016, the Department's Northcentral, (NC), Regional Office sent a final response to your request granting it in part and denying it in part. This letter is intended to correct the NC Regional Office's final response.

You requested the following records for Core Laboratories d/b/a Protechnics, Division of Core Laboratories, LP, located at the Yeager Drill Site, McAdams Road, Washington, Pennsylvania:

- Any and all approvals, permits, licenses/licensures, applications for permits and/or licenses, reciprocity letters, reciprocity licenses, reciprocity agreements and/or reciprocity arrangements, including, but not limited to all licenses issued by the Department to Core Laboratories d/b/a Protechnics, Division of Core Laboratories, LP (hereinafter, "Protechnics") for use, storage and possession of radioactive materials and/or other licensed material. Additionally, this request seeks any and all investigation reports, Notices of Violation(s), Consent Order and Agreement(s) issued to Protechnics by the Department and/or between Protechnics and the Department for any and all work or services performed by Protechnics at any natural gas well site in the Commonwealth of Pennsylvania. Included in this request is a request for copies of all Notices of Violation issued by the Department to Protechnics, including but not limited to Notices of Violation dated June 15, 2010, January 28, 2010, November 26, 2013, September 13, 2013 and October 14, 2013, Violation Numbers 677913, 677915, 677914, 682834, 682833, 682829, 682835 and all corresponding inspection reports, field notes and other related writings. Further, this request seeks any and all Consent Order and Agreements between the Department and Protechnics, including, but not limited to, Consent Orders and Agreements dated November 2, 2013 and November 2, 2010.
- Copies of all enforcement activity taken by the Department against Protechnics, including but not limited to Enforcement ID Numbers 305057, 259202 and 263973, as well as all inspection reports completed by the Department regarding Protechnics, including, but not limited to, Inspection ID Numbers 1891418, 1919964, 2147772, 2204156 and 2221258.

Northcentral Regional Office
208 West Third Street, Suite 101 | Williamsport, PA 17701-6448 | 570.327.3695 | F 570.327.3565
www.depweb.state.pa.us

Attachment
B

- Any and all Radioactive Tracer Well Site Agreements made between Protechnics and any well site operator(s) for each and every well traced in the Commonwealth of Pennsylvania that is or was submitted to the Department, including, but not limited to, the April 7, 2013, Radioactive Tracer Well Site Agreement between Protechnics and a well operator.
- Any and all notifications submitted to the Department by Protechnics or the associated operator or subcontractor regarding Protechnics confirmation that licensed material, including, but not limited to, radioactive material, was returned to the surface at any well site in which Protechnics operated/performed work or services in the Commonwealth of Pennsylvania.
- Any and all documents, correspondence, e-mails and any other communication(s) between Protechnics and the Department and/or Range Resources and the Department regarding Protechnics and any and all work/services performed in the Commonwealth of Pennsylvania by Protechnics.
- Any and all MSDS/SDS (material data safety sheets and safety data sheets) in the possession of the Department regarding any and all products utilized by Protechnics at any well site in Pennsylvania, including, but not limited to, all MSDS/SDS for Protechnics Radioactive Tracer Products, as well as any and all Chemical Frac Tracer ("CFT") products, including, but not limited to, CFT 1000, CFT 1100, CFT 1200, CFT 1300, CFT 2000, CFT 2100, CFT 1900, CFT 1700.

By your email on February 3, 2016, to Department Legal Counsel, Edward Stokan, of the Department's SW Regional Office, you amended your RTKL request to the following:

- All drill sites in the Commonwealth, including but not limited to the Yeager Drill site as indicated in attachment 1 of the original request.

Your request specifically relates to various records involving ProTechnics. The records referenced in the NC Regional Office's final response on March 9, 2016, were not responsive to your request because the NOV sent to you was issued to Citrus Energy Corporation, who was contracted by ProTechnics to conduct a radioactive tracer study. The internal emails withheld were related to those issues and unrelated to your request.

Therefore, the NC Regional Office's final response to your request should have indicated that it did not have responsive records in its custody, control, or possession.

Pursuant to the Office of Open Records' Final Decision in *Jenkins v. Pa. Dep't of State*, No. AP-2009-0065 (Pa. O.O.R.D. April 2, 2009), "It is not a denial of access when an agency does not possess records and [there is no] legal obligation to obtain them (see, e.g. section 67.506 (d)(1))."

Kendra Smith, Esquire

3

March 24, 2016

Further, an agency is not required "to create which does not currently exist or to compile, maintain, format or organize a record in a manner in which the agency does not currently compile, maintain, format or organize the record." 65 P.S. § 67.705.

I apologize for any confusion that this error may have caused. This letter is intended to clarify and supersede the final response issued by the NC Regional Office on March 9, 2016.

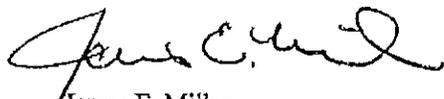
You have a right to appeal this response in writing to Executive Director, Office of Open Records, Commonwealth Keystone Building, 400 North Street, 4th Floor, Harrisburg, Pennsylvania 17120. If you choose to file an appeal you must do so within 15 business days of the mailing date of this response and send to the OOR:

- 1) all Department responses;
- 2) your request; and
- 3) the reason(s) you believe the Department erred in its response.

Also, the OOR has an appeal form available on the OOR website at:

<http://www.openrecords.pa.gov/Using-the-TKL/Pages/RTKLForms.aspx#.VpOKEBwo7X6>

Sincerely,



James E. Miller
Assistant Regional Director

Enclosure



DEP Right-to-Know Law Record Request Form

Business Hours: 8:00 am - 4:30 pm (RTK requests received after 4:30 pm are considered received the next business day)
Mall to: DEP Open Records Officer ("AORO"), DEP/BOS, PO Box 8473, Harrisburg, PA 17105-8473.
Or Fax to: 717-705-8023
Or Email to: EP-DEP-RTK@pa.gov *Request sent to any other email will not be deemed a RTKL request.
Contact: 717-787-2043

Name of Requestor (or Anonymous): Kendra L. Smith, Esq.
Name of Company (or N/A): Smith Butz, LLC
Requestor's Street Address: 126 Technology Drive, Suite 202, Ballay Center I
Requestor's City/State/Zip Code: Canonsburg, PA 15317
Requestor's Telephone Number: (724) 745-5121
Requestor's Email Address: ksmith@smithbutzlaw.com

Records being requested (please sufficiently describe the record(s) requested so that they are identifiable to Department staff.):

Core Laboratories d/b/a Protechnics, Division of Core Laboratories, LP

Name of Individual / Company for records being requested (including former names)

Yeager Drill Site

Facility Name for requested records (if different than Company Name)

McAdams Road, Washington, PA 15301

Street Address (including zip code)

Washington

County(ies)

Amwell

Municipality(ies)

Additional information to assist with search and retrieval of responsive records (e.g. permit no.(s); dates or timeframe of records requested; programs of interest, geographic area):

Please see, "Attachment 1," attached hereto.

FORM OF RECORD PRODUCTION -- check appropriate response:

REQUESTING FILE REVIEW ACCESS:

Seeking access, review and self copying of records is at a reduced cost of \$.15 per page.

YES

NO

REQUESTING DUPLICATION AND MAILING RECORDS:

Agency copying of records is at a cost of \$.25 per page

YES

NO

REQUESTING CERTIFICATION OF RECORDS:

I WANT DEP TO CERTIFY RECORDS (AT A COST OF \$5.00 PER REQUEST):

YES

PENNSYLVANIA – OFFICE OF OPEN RECORDS
RIGHT-TO-KNOW REQUEST

“ATTACHMENT 1”

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From: Kendra L. Smith [mailto:klsmith@smithbutzlaw.com]
Sent: Wednesday, February 03, 2016 2:50 PM
To: Stokan, Edward
Subject: RE: February 1, 2016 RTKL Request re ProTechnics

It is for all drill sites in the Commonwealth including but not limited to the Yeager Drill site as indicated in attachment 1. Thank you.

Kendra L. Smith, Esq.
Smith Butz, LLC
Attorneys at Law
125 Technology Drive, Suite 202
Bailey Center I, Southpointe
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----- Original Message -----

Subject: February 1, 2016 RTKL Request re ProTechnics
From: "Stokan, Edward" <estokan@pa.gov>
Date: Wed, February 03, 2016 2:46 pm
To: "klsmith@smithbutzlaw.com" <klsmith@smithbutzlaw.com>

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However, your Attachment 1 indicates that you are seeking responsive records as to any natural gas well site in the Commonwealth.

Can you please confirm whether you seek records pertaining only to the Yeager Drill Site or pertaining to all gas well sites throughout the Commonwealth?

Edward S. Stokan | Assistant Counsel
Department of Environmental Protection | Office of Chief Counsel
Southwest Regional Office
400 Waterfront Drive | Pittsburgh, PA 15222.
Phone: 412.442.4262 | Direct Phone: 412.442.4249 | Fax: 412.442.4274
www.depweb.state.pa.us

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DEP Southwest Regional Office

AFFIDAVIT OF BARBARA BOOKSER

I, Barbara Bookser, declare under penalty of perjury, pursuant to 18 Pa.C.S. § 4904, that the following statements are true and correct based upon my personal knowledge, information and belief:

1. I have worked for the Commonwealth of Pennsylvania, Department of Environmental Protection (DEP) for 6 years.

2. I presently serve as Section Chief for DEP's Radiation Protection Program (Program) in the Southwest and Northwest Regional Offices. I have served as the Section Chief since June 2009. My duties include the supervision and oversight of field staff and Program activities in the SW and NW Regions of DEP, including inspection, compliance, enforcement, registration and licensing.

3. The Program's mission is to ensure that public, occupational, and environmental exposure to radiation from man-made and controllable natural sources is as low as reasonably achievable.

4. Since 2008, the Program has inspected users of radioactive materials as part of an agreement with the U.S. Nuclear Regulatory Commission (NRC). In addition, it inspects all licensed and/or registered radiation-producing machines in Pennsylvania.

5. Throughout my career with DEP, I have actively assisted in searching for and retrieving records for both informal records requests and formal records requests made pursuant to the Right-to-Know Law, 65 P.S. §§ 67.101-67.3104 (RTKL), and its predecessor.

6. Presently, if the scope of a request for records falls within the purview of the Program, I help ensure that the Program responds comprehensively with a full inquiry into, and review of, all potentially responsive records possessed by the Program. Responsive records

Affidavit of Barbara Bookser

include, but are not limited to, paper records, electronic records, maps, sampling results, microfiche, photographs and video.

7. Given my responsibilities and experiences as Program Manager, I am familiar with the records stored within the Program, including where those records are located, how they are maintained and the Program personnel who might possess those records.

8. I am familiar with the February 1, 2016, Right-to-Know Law (RTKL) request filed by Kendra L. Smith (Smith), seeking records for Core Laboratories d/b/a Protechnics, Division of Core Laboratories, LP located at the Yeager Drill Site, McAdams Road, Washington, Pennsylvania, as follows:

- Any and all approvals, permits, licenses/licensures, applications for permits and/or licenses, reciprocity letters, reciprocity licenses, reciprocity agreements and/or reciprocity arrangements, including, but not limited to all licenses issued by the Department to Core Laboratories d/b/a Protechnics, Division of Core Laboratories, LP (hereinafter, "Protechnics") for use, storage and possession of radioactive materials and/or other licensed material. Additionally, this request seeks any and all investigation reports, Notices of Violation(s), Consent Order and Agreement(s) issued to Protechnics by the Department and/or between Protechnics and the Department for any and all work or services performed by Protechnics at any natural gas well site in the Commonwealth of Pennsylvania. Included in this request is a request for copies of all Notices of Violation issued by the Department to Protechnics, including but not limited to Notices of Violation dated June 15, 2010, January 28, 2010, November 26, 2013, September 13, 2013 and October 14, 2013, Violation Numbers 677913, 677915, 677914, 682834, 682833, 682829, 682835 and all corresponding inspection reports, field notes and other related writings. Further, this request seeks any and all Consent Order and Agreements between the Department and Protechnics, including, but not limited to, Consent Orders and Agreements dated November 2, 2013 and November 2, 2010.
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- Any and all Radioactive Tracer Well Site Agreements made between Protechnics and any well site operator(s) for each and every well traced in the

Affidavit of Barbara Bookser

Commonwealth of Pennsylvania that is or was submitted to the Department, including, but not limited to, the April 7, 2013, Radioactive Tracer Well Site Agreement between Protechnics and a well operator.

- Any and all notifications submitted to the Department by Protechnics or the associated operator or subcontractor regarding Protechnics confirmation that licensed material, including, but not limited to, radioactive material, was returned to the surface at any well site in which Protechnics operated/performed work or services in the Commonwealth of Pennsylvania.
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- Any and all MSDS/SDS (material data safety sheets and safety data sheets) in the possession of the Department regarding any and all products utilized by Protechnics at any well site in Pennsylvania, including, but not limited to, all MSDS/SDS for Protechnics Radioactive Tracer Products, as well as any and all Chemical Frac Tracer ("CFT") products, including, but not limited to, CFT 1000, CFT 1100, CFT 1200, CFT 1300, CFT 2000, CFT 2100, CFT 1900, CFT 1700.

9. I am also familiar with the February 3, 2016, amendment to the Smith request which sought "all drill sites in the Commonwealth including but not limited to the Yeager Drill."

10. Upon receipt and review of Smith's request, the SW Regional Office's File Clerk Jeffrey Brown determined that any records responsive to the request would fall within the purview of the Program. Brown advised Program employees of Smith's request. He requested that Program staff locate and collect responsive records.

11. The scope of the record search included checking files within the Program's file room, program staff offices, and electronically stored information. I spoke with staff in the Program who would possibly have responsive records in their custody, control, or possession.

12. After conducting its search, the Bureau determined that 1,641 pages of records responsive to Smith's request were in its custody, possession or control. The bulk of the Bureau's records pertained to licensing issues, and to a lesser extent, investigative matters.

Affidavit of Barbara Bookser

13. I reviewed the SW Regional Office's March 9, 2016, final response denying Smith access to 1,641 pages of responsive records. I am aware that Smith filed an appeal with the Office of Open Records from the denial of access made by each DEP office responding to her request, including the SW Regional Office.

14. I am familiar with the SW Regional Office's Exceptions Log that is attached as Affidavit Exhibit A.

15. The 1,641 pages of responsive records to which the SW Regional Office has denied Smith access are accurately described in the Exceptions Log.

16. For any records not provided, or not accounted for in the SW Regional Office's Exceptions Log, no other records exist in its custody, control, or possession.

17. The objective of DEP's licensing program is to ensure that radioactive material is used safely and disposed of properly, and that facilities are free from contamination when licensed operations cease.

18. On March 31, 2008, in order to more efficiently, uniformly, and safely control radioactive material, Pennsylvania entered into an agreement with the NRC to expand DEP's authority over the licensing and regulation of byproduct, source, and special nuclear material. A copy of the agreement is incorporated into this affidavit. *See* Affidavit of David J. Allard, CHP (Allard), Attachment A¹.

19. Operators are required to ensure that licensed material is used, transported, stored, and disposed of in such a way that members of the public will not receive more than 1 mSv (100 mrem) in one year, and the dose in any unrestricted area will not exceed 0.02 mSv (2 mrem) in

¹ I have read the affidavit of David J. Allard, CHP submitted in response to this appeal. For the sake of eliminating unnecessary duplication of attachments and records submitted on behalf of DEP, Allard's affidavit, and its attachments, are incorporated by reference into this affidavit where noted.

Affidavit of Barbara Bookser

any one hour. 10 CFR 20.1301(a)(1)-(2). DEP regulations must be at least as stringent as the Federal regulations, but not less. Federal standards were created with the understanding that there are natural background radiation levels. However, facilities that utilize radioactive materials or radiation producing machines are required to use practices, procedures, and control doses that are as low as reasonably achievable per 10 CFR 20.1101(b) to protect the general health and safety.

20. Operators are required to secure stored licensed material from access, removal, or use by unauthorized personnel. 10 CFR 20.1801. Operators are also required to control and maintain constant surveillance of licensed material when in use and not in storage. 10 CFR 20.1802. These Federal Regulations were created and adopted by DEP because it is imperative that operators maintain control of their materials and do not provide opportunities for unauthorized access or removal of their license materials. If these materials were not under constant surveillance, it is possible that they could be stolen and used with malicious intent to harm the public through the creation of a "dirty bomb" and provide unwilling radiation exposure to others. Exposure to high level radiation, even if it is still contained in the sealed source, can cause loss of limbs, narcosis, or death. The fact that a source is sealed does not mean that it is shielded to the extent that it would prevent a person from receiving radiation exposure.

21. Federal and state regulatory agencies maintain records of the amount and type of radionuclides used by licensees. Radionuclides are atoms that have excess energy that makes them unstable. This excess energy can create and emit (from the nucleus or electron orbits) new radiation, a new particle or photon, or transfer its excess energy to one of its sub-particles causing it to be ejected.

Affidavit of Barbara Bookser

22. The NRC, and approved state agencies, regulate the use of injected tracer radionuclides during hydraulic fracturing. DEP is an approved state agency.

23. ProTechnics offers services in the field of completion, reservoir, and drilling diagnostics. Completion diagnostic services use image and tracing services to provide direct measurements of a fracture height, zonal coverage, sand (or proppant) distribution, wellbore connectivity, and fracture fluid performance. Reservoir diagnostic services provide surveillance of injected fluid flow within a reservoir. Tracer services for a reservoir diagnostic surveillance are used in cases of a water flood, gas flood, steam flood, and surfactant flood. Drilling diagnostic services uses tracers to determine the amount of drilling fluid invasion in core samples and formation fluid samples that provide the following: the *in situ* solid waste and hydrocarbon saturations of a formation; the residual waste of a formation for log calibration purposes; and contamination in downhole formation fluid samples.

24. eFACTS is DEP's Environmental Facility Application Compliance Tracking System (eFACTS) that allows members of the public to search for authorizations, clients, sites and facilities. Users can also search the database to find inspection and pollution prevention visits as well as inspection results data, including enforcement information when violations are noted. DEP provides a name search to use when it is not known if the entity is a client, site, or facility.

25. The Program generated Inspection ID No. 1919964 in eFACTS as the result of its October 5, 2010 inspection of a ProTechnics temporary job site in Butler County, Buffalo Township. At the site, ProTechnics conducted a radioactive tracer study on one well; and a standard well logging study on a second well approximately 30 feet away. The Program

Affidavit of Barbara Bookser

Inspector examined this activity and reviewed documents Protechnics was required to hold on-site. The Program Inspector found no violations.

26. I am aware that DEP's Central Office and Southcentral Regional Office have taken enforcement action against ProTechnics.

27. To resolve DEP's enforcement actions, ProTechnics entered into a Consent Order and Agreement with DEP on November 2, 2010. *See* Affidavit of David J. Allard, CHP, Attachment D. The Consent Order and Agreement assessed a civil penalty of \$29,000 against ProTechnics and required the following corrective actions:

- A requirement that ProTechnics must provide a well site agreement to each well owner/operator to educate them of the proper procedures in the event of a flowback. Flowback is a water based solution that flows back to the surface during and after the completion of hydraulic fracturing;
- A requirement that ProTechnics must provide an instructional session to each well owner/operator that included radiation safety proper procedures for handling flowback incidents and disposal of radioactive residual waste;
- A requirement that ProTechnics must notify DEP when a flowback event has occurred and that it verified to see if any radioactive material returned back to the surface of the well;
- A requirement that ProTechnics must complete a survey and area sketch of the flowback area after the event occurred per the specifications of their emergency operating procedures;
- A requirement that ProTechnics must complete a formal report within 30 days of the flowback event and submit it to DEP;
- A requirement that ProTechnics amend its license to include the submission of a properly executed well site agreement with the well owner/operator within five business days of its completion;
- A requirement that ProTechnics amend its license to add a condition that would require it to coordinate with the well owner/operator to stabilize a pit used to bury radioactive residual waste for onsite decay so that the pit remained intact and did not wash out during weather events;

Affidavit of Barbara Bookser

- A requirement that ProTechnics amend its license to add a condition that it would at least annually inspect the area where the radioactive residual waste is buried to make sure it was intact, marked and fenced off;
- A requirement that ProTechnics immediately notify DEP upon confirming that radioactive material was contained in a flow back incident; and
- A requirement that ProTechnics amend its license to include the proper notification methods to DEP.

28. For DEP's noncriminal investigations noted in paragraphs 82 through 89 of this affidavit, DEP routinely performs the following general steps:

- a. Upon receiving notification from a waste disposal facility, the Radiation Protection Program will request information from the facility about the load of waste, including but not limited to, the type of waste and volume; the isotope identified; the activity of the isotope; the generator of the waste; the identity of the person(s) who performed a radiation survey; the type of equipment used to survey the waste; the current location of the waste; and a determination from the facility of its plans for the waste load. Because each flowback incident might produce radioactive waste containing an isotope that does not meet established exemptions for municipal waste, it cannot be disposed at a landfill. Therefore, a U.S. Department of Transportation Special Permit is issued to reject the load and return it to its place of origin or designated place of destination.
- b. If we investigate a flowback/loss of control incident at a site, the Program will contact the waste generator directly and/or assign a Radiation Health Physicist to investigate the flowback/loss of control incident, seek to identify all parties involved, and investigate how the loss of control of licensed material occurred. Whenever possible, the Radiation Health Physicist will document site conditions in a formal inspection report and possibly obtain photographs of the site.
- c. Once completed, all documentation is submitted to Program Staff for review and approval of the inspection findings. Depending upon the severity of the violation, Regional Radiation Protection Management Staff will disclose inspection findings in accordance with its established Compliance and Enforcement Guidance Document. If additional information is needed prior to disclosing inspection findings, DEP will schedule a conference.

Affidavit of Barbara Bookser

Radiation Protection Act and Regulations

29. The General Assembly enacted the Radiation Protection Act because radiation exposure has the potential for causing undesirable health effects and the citizens of the Commonwealth should be protected from unnecessary and harmful exposure resulting from use of the radioactive materials, radiation sources, accidents involving nuclear power, and radioactive material transportation. 35 P.S. § 7110.102 and 25 Pa Code 215.1(a).

30. The purpose of the Act was to establish and maintain a comprehensive program of radiation protection within DEP; provide for licensing and regulations in cooperation with the Federal Government, other states agencies and appropriate private entities; to maintain a comprehensive radiation monitoring program; to maintain a technical emergency radiation response capability within DEP; and establish an emergency response program. 35 P.S. § 7110.102.

31. The Radiation Protection Act designated DEP as the agency of the Commonwealth with the authority to control radiation sources. 35 P.S. § 7110.301(a). DEP is also charged with developing and conducting a program to control and evaluate the hazards associated with radiation sources and radiation source users. 35 P.S. § 7110.301(c)(1).

32. DEP has the power and duty through the Radiation Protection Act to conduct studies and investigations relating to the control, regulation, and monitoring of radiation sources, and to collect and to disseminate information related to the control of radiation sources and the effects of radiation exposure. 35 P.S. § 7110.301(c)(12)-(13).

33. DEP has the statutory authority to enter a facility for the purpose of determining compliance with the Radiation Protection Act; any license conditions; or any rules, regulations, or orders issued under the Radiation Protection Act. DEP also has the statutory authority in an

Affidavit of Barbara Bookser

investigation to conduct tests, inspect or examine any radiation source records, or other physical evidence related to the use of a radiation source. 35 P.S. § 7110.305.

34. DEP's regulations promulgated under the Radiation Protection Act provides it with the authority to "enter the premises of a licensee" in order to conduct an investigation or inspection to ascertain whether the licensee is in compliance with the Radiation Protection Act and its regulations. 25 Pa. Code § 215.12(b)(3). Under this regulation, DEP also has the authority to conduct an investigation or inspection to protect health, safety, and the environment. 25 Pa. Code § 215.12(b)(3). This regulation includes the right of DEP to access records and other physical evidence, and requires a licensee to make a report or furnish information to DEP. 25 Pa. Code § 215.12(b)(1)-(2).

35. Section 215.14 of DEP's regulations, 25 Pa. Code § 215.14, provides, in pertinent part:

The following Department records are not available for public inspection, unless the Department determines that disclosure is in the public interest and is necessary for the Department to carry out its duties under the act:

- (1) Trade secrets or secret industrial processes customarily held in confidence.
- (2) A report of investigation, *not pertaining to safety and health in industrial plants, which would disclose the institution, progress or results of an investigation undertaken by the Department.*

(emphasis added). Put more clearly, if an investigation report does not pertain to the safety and health of industrial plants, it is not publicly available.

36. DEP interprets the reference to "industrial plant" in 25 Pa. Code § 215.14(2) as a building for carrying out industrial labor. DEP's interpretation of this term is consistent with the interpretation of the United States Government Accountability Office (GAO).

Affidavit of Barbara Bookser

37. I reviewed the affidavit of David J. Allard, CHP, Director of DEP's Bureau of Radiation Protection, regarding DEP's investigation of ProTechnics. His affidavit verifies that DEP's investigations did not involve an industrial plant. The well pads where the events took place resulting in DEP's investigation fell outside of the definition. Therefore, records relating to DEP's investigation of ProTechnics are not public under 25 Pa. Code § 215.14(2). The SW Regional Office acted in a manner consistent with this conclusion.

38. The SW Regional Office identified 1,641 pages of records related to ProTechnic's activities that are protected under the Radiation Protection Act and its regulations and are exempt from production as noted in this affidavit. These records are also exempt from production under the RTKL public safety and security records exception; the RTKL internal, predecisional deliberation records exception; the RTKL noncriminal investigation exception; and the Regulatory Preclusion to the Release of Records at 25 Pa. Code § 215.14(2), pursuant to Section 305(a)(3) of the RTKL.

Public Safety and Security

39. Radioactive materials files cannot be released to the public for public safety and security reasons. If the information contained in the radioactive materials files were released to the public and obtained by an individual with criminal intent, the public's health and safety could be severely compromised. An individual could potentially cause radioactive material to be widely dispersed resulting in greater environmental contamination and public exposure to radioactive material potentially leading to harmful health effects.

40. Furthermore, the release of this sensitive information could pose a potential threat to the personal safety of individuals employed in the use of radioactive materials. If ProTechnics

Affidavit of Barbara Bookser

or the well owner operator's personal contact information was released, a person with malicious intent could target them to obtain unauthorized access to radioactive material.

41. The health consequences related to unintentional exposure to radiation sources range from burns, nausea, vomiting, diarrhea, headaches, tissue and organ damage, narcosis, blindness, cancer and even death. These health consequences represent a significant potential harm to public safety.

42. DEP's radioactive materials files also contain information regarding the current location and quantity of radioactive materials possessed by licensees. Making this information available to the public presents a risk "reasonably likely to jeopardize or threaten public safety or preparedness or public protection activity." Location and quantity information, should it be publicly available, could be used by terrorists or other criminals who want to obtain radioactive materials or could create an increased threat to the licensee housing the materials thus making it a target of criminal activity. An increased threat would exist of exposing other persons to radioactive materials, and the associated health risks, after the materials were taken from the licensee.

43. DEP's radioactive materials files also contain information regarding the current location and quantity of radioactive materials possessed by licensees. Making this information available to the public presents a risk "reasonably likely to jeopardize or threaten public safety or preparedness or public protection activity." Location and quantity information, should it be publicly available, could be used by terrorists or other criminals who want to obtain radioactive materials or could create an increased threat to the licensee housing the materials thus making it a target of criminal activity. An increased threat would exist of exposing other persons to

Affidavit of Barbara Bookser

radioactive materials, and the associated health risks, after the materials were taken from the licensee.

44. Individuals have manipulated the information contained in a radioactive materials license and other files to unlawfully obtain radioactive materials and use those radioactive materials to harm the public. The sensitive nature of the subject matter contained in all radioactive materials files provides an individual insight into the radioactive materials license application process and the documentation needed to fraudulently obtain radioactive materials. This insight includes what a radioactive materials license looks like, the type of training licensees must complete as required by DEP, specifics regarding radiation protection programs, and internal DEP tracking numbers.

45. There are documented cases of regulatory agencies approving license applications from fictitious entities that then fraudulently obtained radioactive materials. *See Allard Affidavit incorporated Attachment G: Nuclear Security: Actions Taken by NRC Strengthens Its Licensing Process for Sealed Radioactive Sources are Not Effective*, Government Accountability Office (2007); Kathleen Day, *Sting Reveals Security Gap at Nuclear Agency*, The Washington Post, July 12, 2007; and David Kestenbaum, *GAO Sting Uncovers Nuclear Security Shortcomings*, NPR, July 12, 2007.

46. These articles highlight the nexus between the disclosure of radioactive materials license files and the realistic scenarios DEP is seeking to avoid. By withholding radioactive material files, DEP hopes to thwart individuals with malicious intent in the first instance. As a direct result of exempting these records as permitted under the RTKL, these individuals will lack the basic information required to prepare fraudulent documents and obtain radioactive materials

Affidavit of Barbara Bookser

in this Commonwealth. DEP believes that this is a very important step in protecting public health and welfare from the hazards of radiation sources.

47. Recent events highlight why information related to radioactive material needs to be protected. As emphasized in a recent CNN article, the ISIS terrorists who bombed the airport and attacked the metro in Brussels were secretly videotaping a Belgian nuclear official. The official worked at a facility that had radiological material that terrorists could use for a "dirty bomb." A copy of the CNN article is incorporated into this affidavit. *See* Affidavit of Lisa A. Forney (Forney), Attachment 1. Joe Cirincione, *Nuclear terrorist treat bigger than you think*, CNN, April 1, 2016, <http://www.cnn.com/2016/04/01/opinions/nuclear-terrorism-threat-cirincione/index.html>.

48. The CNN article also underscores how even small amounts of radioactive material, such as the size of a pencil eraser, can be used to spew a radioactive cloud over tens of square blocks. Such a cloud could cause the area to be uninhabitable for years until scrubbed clean. This could cause economic losses in the trillions to the affected area and an increased risk of cancer to those exposed to the cloud.

49. The article is consistent with DEP's position that the best way to prevent terrorist attacks is to eliminate, reduce, and secure all supplies of nuclear materials so that terrorists would find it too difficult to get them.

50. DEP did not provide the following information for ProTechnics' employees: names, home mailing addresses, phone numbers, or email addresses. As highlighted in the CNN article, employees who manage radioactive material have been targeted by terrorist groups. As Smith states in her appeal and in Attachment 2, it is true that ProTechnics' has its headquarter address and main telephone listed on its website. However, the names of the individuals, their

Affidavit of Barbara Bookser

direct lines, and email addresses are not provided. DEP redacted mailing addresses to prevent the possibility of someone with malicious intent to be able to narrow down which specific office the individual from ProTechnics is assigned. This effort was made in order to avoid public safety concerns like those discussed in the CNN article.

51. Although the half-life of the radioactive materials possessed by ProTechnics is less than 120 days, the records contained in the ProTechnics file (and in any radioactive materials licensee's file), are still sensitive if made public as a tool for obtaining access to licensed materials as previously noted. Half-life refers to the amount of time it takes for one half of a quantity of radioactive material to become stable. The overall radioactivity is therefore dependent upon the original quantity.

52. Furthermore, radioactive material with a half-life of less than 120 days can still be used to harm the public and cause environmental contamination and lead to detrimental health effects. Even after one or more half-lives are reached through the decay process, radioactive material is still radioactive and will result in a person being exposed to radiation. While the rate of exposure may have decreased, prolonged contact may result in radiation effects ranging from burns, headaches, diarrhea, cell, tissue and organ damage, cancer, and/or possibly death.

53. Smith did obtain information regarding ProTechnics' radioactive materials license issued by the agreement states of Texas and Colorado for work using radioactive material in their states. Smith was also able to obtain the NRC event notification report for an event that Colorado reported to the NRC. As discussed in Allard's Affidavit, including Attachment A, the Commonwealth of Pennsylvania is an NRC Agreement State and therefore is the agency with current authority to regulate most radioactive materials within the Commonwealth.

Affidavit of Barbara Bookser

54. Agreement states must meet minimum requirements to remain an agreement state such as providing the NRC with event notification reports. An agreement state also undergoes a periodic Integrated Materials Performance Evaluation Program (IMPEP). During an IMPEP, the NRC evaluates the agreement state by using performance indicators that include the following: its materials inspection program; the technical quality of inspection, staffing and training; the quality of licensing actions; and the technical quality of incident and allegation activities. The evaluation's purpose is to determine whether an agreement state is compatible with NRC's established program. Agreement states, like Pennsylvania, do not have direct control over how the NRC decides to release the event notification information on the NRC website once it provides the information to the NRC.

55. As an NRC Agreement State, DEP takes its duty to protect the citizens of the Commonwealth from the hazards of radiation sources seriously and therefore withholds radioactive materials files from public disclosure as permitted by the law to protect public health, safety, and security.

56. Federal regulatory agencies and their records, such as the NRC, are bound by the Freedom of Information Act, 5 U.S.C. § 522, and may make certain information publically available. Similarly, Texas and Colorado regulatory agencies are bound by state record laws and may make certain information publically available. However, DEP protects information related to radiation sources to the full extent allowed by Commonwealth law to prevent fraudulent acquisition of radioactive materials within the Commonwealth and the subsequent threat that would cause to the health, safety, and security of its citizens.

57. DEP's radioactive materials files also contain information regarding the current location and quantity of radioactive materials possessed by licensees. Making this information

Affidavit of Barbara Bookser

available to the public presents a risk "reasonably likely to jeopardize or threaten public safety or preparedness or public protection activity."

58. Location and quantity information, should it be publicly available, could be used by terrorists or other criminals who want to obtain radioactive materials or create an increased threat to the licensee housing the materials thus making it a target of criminal activity. An increased threat would exist of exposing other persons to radioactive materials, and the associated health risks, after the materials were taken from the licensee. This is further highlighted in Allard Affidavit, Attachment G and Attachment 1 to this affidavit.

59. Waste disposal and processing facilities, like landfills, are regulated by DEP's Radiation Protection Program, in addition to other DEP programs. Landfills are statutorily required to submit a Radiation Action Plan (Plan) also known as a "Plan X" to DEP under 25 Pa. Code § 273.223. The submittal of a Plan became a requirement in December 2000. Landfills already permitted as of December 2000, applied for a permit modification to incorporate the use of the Plan. From this point in time, new facilities submitted the plan as part of their permit application.

60. The purpose of the plan is to protect the environment and the public's health, safety, and welfare from the possible dangers of radioactive material delivered to solid waste processing and disposal facilities.

61. The plan is reviewed by staff in DEP's waste management and radiation protection programs to ensure that a comprehensive radiation monitoring program is in place. DEP also reviews the plan to see that the facility established an adequate radiation protection program that effectively monitors waste entering the landfill, screens for radioactive material, and implements proper actions in the event that radioactive material is present in a waste load.

Affidavit of Barbara Bookser

62. DEP created a guidance document on a Plan's contents. A copy of the guidance document is incorporated into this affidavit. *See* Forney Affidavit, Attachment 2. The plan submitted by the landfill must include the following:

- Discussion of the type of monitoring equipment that will be used to monitor inbound waste for radioactive material;
- A list of individuals responsible for monitoring radioactive materials in the inbound waste;
- An established isolation area for waste to be temporarily stored until it can be tested to determine what isotope is present and how much activity is present;
- Established action levels for responding to radiation alarms and proper procedures to ensure compliance; and
- Established points of contact with DEP to report radiation alarms.

63. As noted by Smith within her appeal, DEP did not redact the names of the landfills where ProTechnics' radioactive tracers in the flowback from the well were taken for disposal. However, ProTechnics' radioactive tracers were not disposed of at these landfills.

64. ProTechnics' radioactive tracers triggered an alarm upon each of the three investigated arrivals to the landfill. Consequently, the landfill followed its Radioactive Action Plan and contacted DEP.

65. DEP subsequently issued a DOT Special Permit 11406 Shipment Approval Form. This special permit allowed the landfill to reject the noncompliant load and return it to its point of origin at the well pad. Since the load containing radioactive material was rejected, it was never disposed of at the landfill. With no radioactive material on-site, and no public security concerns, DEP saw no reason to exclude the landfill names in its response to Smith's RTKL request.

66. There are no Pennsylvania landfills specifically licensed to receive low-level radioactive waste. Therefore, ProTechnics' radioactive tracers cannot be buried on any landfill site within the Commonwealth.

Affidavit of Barbara Bookser

67. Despite Smith's contentions within her appeal, the gas well sites where the radioactive tracer materials are injected are not akin to landfills. Additional safety concerns exist for gas well sites. Gas well sites involve highly flammable gas. Workers, as well as government inspectors, are required to wear flame retardant clothing and complete safety training before entering the well pad.

68. Gas well sites also contain large drilling equipment. Often, the visibility of an operator is obstructed with large blind spots that can result in someone being struck by the heavy equipment resulting in loss of limbs, blunt trauma, or death depending on the piece of equipment. According to the United States Department of Labor, Occupational Safety and Health Administration, the job fatality rate for oil and gas extraction workers is seven times greater than the rate for all other U.S industries. *See* <https://www.osha.gov/SLTC/oilgaswelldrilling/>.

69. If the gas well names were provided, someone with malicious intent would have access to a highly volatile site that contains both radioactive and highly flammable materials. A person could cause great harm to workers at the site, in addition to the general public, such as explosions, fires, and exposure to radioactive material that can cause a number of detrimental health effects as explained throughout this affidavit.

70. In light of the public safety and security issues raised in this affidavit and contained in Allard's Affidavit, notably Attachment G, the SW Regional Office believes that withholding radioactive materials files from public access is necessary to protect public health, safety, and security from radiation exposure.

71. The records contained in the ProTechnics file, and in any radioactive materials licensee file, are sensitive if made public as a tool for obtaining access to licensed materials as previously noted. Furthermore, radioactive material with a half-life of less than 120 days can still

Affidavit of Barbara Bookser

be used to harm the public and cause environmental contamination and lead to detrimental health effects. Even after it has reached a half-life, radioactive material is still radioactive and will result in a person being exposed to radiation. While the rate of exposure may have decreased, prolonged contact can result in radiation effects ranging from burns, headaches, diarrhea, tissue and organ damage, and possibly death.

72. The 1,641 pages of responsive records to which DEP's SW Regional Office has denied Smith access are described in the Exceptions Log at Entry Nos. 1 through 6. These records include ProTechnics' application for reciprocity license; ProTechnics' application for specific license; ProTechnics' reciprocity license; ProTechnics' specific license; ProTechnics' license amendments; related correspondence between DEP and ProTechnics; records reflecting DEP's internal, predecisional deliberations on inspection, monitoring and enforcement of ProTechnics' operations; and records reflecting DEP investigations into those operations.

73. These records contain sensitive information relating to radioactive materials, in particular radioactive tracers, and discuss radioactive material strength, material half-life, material isotope types, material quantities, material storage methods and location, and related environmental concerns. In addition, these records cite or discuss sensitive information relating to radioactive materials, in particular radioactive tracers, including licensees' names, license numbers, physical addresses, ProTechnics' employees' identities, ProTechnics' employees' email addresses, types of radioactive material sources, activities of sources, quantities of sources, locations of sources, use of sources or modalities, names of authorized users, contact names at the site, license-specific information, inspection reports, SW Regional Office staff who have knowledge of the sources, and documentation of security controls implemented at a site to prevent unauthorized access to the sources.

Affidavit of Barbara Bookser

74. For the reasons outlined above, disclosure of the records would risk public safety and security. DEP's SW Regional Office has therefore withheld them. These records are also subject to the Regulatory Preclusion to the Release of Records at 25 Pa. Code § 215.14(2), pursuant to Section 305(a)(3) of the RTKL, 65 P.S. § 67.305(a)(3), as noted with SW Regional Office's Exceptions Log.

Internal, Predecisional Deliberations

75. DEP employees, met and discussed among themselves the process needed to investigate the multiple compliance incidents involving ProTechnics, various interim actions to be taken during its investigations of ProTechnics, possible strategies to be employed for meetings with ProTechnics, preliminary discussions and drafts of proposed enforcement actions for all three investigations involving ProTechnics, and various issues pertaining to ProTechnics licensing. These discussions and drafts were circulated among DEP personnel through emails, memorandums, and meeting notes for further consideration prior to arriving at final determinations.

76. DEP's internal, predecisional, deliberative records pertaining to ProTechnics and its activities included the DEP employees identified within the SW Regional Office's Exceptions Log.

77. Records considered as being or reflecting DEP's deliberations pertained inspections, monitoring and enforcement of environmental law, including the Radiation Protection Act and its regulations, to assure ProTechnics' compliance with its reciprocity license, specific license, and license amendments. To do so effectively, program employees have met and discussed among themselves the most efficient and effective strategy or course of action. The subjects of deliberation have included monitoring and enforcement strategies, license and

Affidavit of Barbara Bookser

license amendment requirements, reviews of submitted reports, inspection findings and DEP's handling of public safety and security issues. These internal, predecisional deliberations have been made through, or been reflected in, DEP-internal emails.

78. Records withheld from Smith in response to his RTKL request as exempt under the internal, predecisional deliberative records exception and contain no final decisions of DEP. These records are also subject to protection under the Radiation Protection Act and the public safety and security exemptions of the RTKL. These exemptions are additionally explained in this affidavit and are reflected in the SW Regional Office's Exceptions Log.

79. None of the withheld internal, predecisional deliberative records were created after the final decision to which they correlate. The records do not contain purely factual information.

80. As described in the Exceptions Log at Entry No. 4, DEP's SW Regional Office withheld 35 pages of emails because those records reflect these internal, predecisional deliberations by the Program, which were internal to DEP and did not involve any outside third party.

81. The 35 pages of emails that the SW Regional Office is withholding reflect internal deliberations made prior to any final decision and do not include any such final decision.

Noncriminal Investigations

82. Pursuant to 35 P.S. § 7110.305(a) and 35 P.S. § 7110.301(c)(12) of the Radiation Protection Act, DEP has the following statutory authority to conduct investigations:

The department or its duly authorized representatives shall have the power to enter at all reasonable times with sufficient probable cause upon any public or private property, building, premise or place, for the purposes of determining compliance with this act, any license conditions or any rules, regulations or orders issued under this act. In the conduct of an investigation, the department or its duly authorized representatives shall have the authority to conduct tests, inspections or

Affidavit of Barbara Bookser

examination of any radiation source, or of any book, record, document or other physical evidence related to the use of a radiation source.

35 P.S. § 7110.305(a).

It also provides DEP the authority to:

Encourage, participate in or conduct studies, investigations, training, research, remedial actions and demonstrations relating to control, regulation and monitoring of radiation sources.

35 P.S. § 7110.301(c)(12).

83. Additionally, Section 215.12 of the Radiation Regulations states:

- (a) *Maintenance of records.* Licensees and registrants shall maintain records under this article and have these records available for inspection by the Department at permanent sites or facilities of use identified in a license or registration issued under this article.
- (b) *Rights of the Department.* The Department and its agents and employees will:
 - (1) Have access to, and require the production of, books, papers, documents and other records and physical evidence pertinent to a matter under investigation.
 - (2) Require a registrant or licensee to make reports and furnish information as the Department may prescribe.
 - (3) Enter the premises of a licensee or registrant for the purpose of making an investigation or inspection of radiation sources and the premises and facilities where radiation sources are used or stored, necessary to ascertain the compliance or noncompliance with the act and this chapter and to protect health, safety and the environment.
- (c) *Inspections and investigations by the Department.* The Department, its employees and agents may conduct inspections and investigations of the facilities and regulated activities of registrants of radiation-producing machines and licensees of radioactive material necessary to demonstrate compliance with the act or this article.
- (d) *Additional inspections and investigations.* The Department, its employees and agents may conduct additional follow-up inspections and investigations if violations of the act or regulations promulgated thereunder were noted at the time of the original inspection, or if a person presents information, or circumstances arise which give the Department reason to believe that the health and safety of a person is threatened or that the act or this article are being violated.”

Affidavit of Barbara Bookser

84. As described in the SW Regional Office Exceptions Log at Entry Nos. 5 and 6, the SW Regional Office is withholding 26 pages of emails and 14 pages of inspection reports because disclosure of these records would reveal the institution, progress or result of noncriminal investigations DEP conducted to assure ProTechnics' compliance with its reciprocity license, specific license, and license amendments. These records include investigative information like survey locations, hot spot locations, dose rates, radionuclide types, photographs, and spectrographs. These records include the inspection report and emails related to the Program inspection identified in eFACTS as Inspection ID No. 1919964 and as described above in Paragraph 25.

85. The 26 pages of emails and 14 pages of inspection reports that the SW Regional Office is withholding do not pertain to DEP investigations into health and safety of ProTechnics or an industrial plant but rather pertain to investigations into ProTechnics operations at landfills and drilling sites.

86. The 26 pages of emails and 14 pages of inspection reports that the SW Regional Office is withholding do not memorialize the imposition of a fine or civil penalty; the suspension, modification, or revocation of a license, permit, registration, certification or similar authorization issued by DEP; or an executed settlement agreement.

87. However, the disclosure of some of the withheld records could easily discourage witnesses or other individuals from coming forward to assist DEP in investigations for fear of retaliation or embarrassment. Disclosing these records risks a chilling effect on the public's participation in these and future investigations. Disclosure also risks public access to unsubstantiated allegations. This is why complaints, as investigative records, are protected by the RTKL.

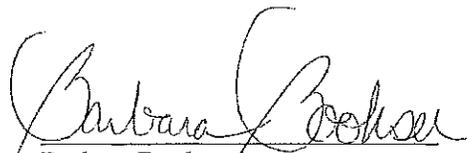
Affidavit of Barbara Bookser

88. Disclosure of the withheld records would hinder DEP's ability to secure an appropriate administrative or civil sanction, by impeding DEP's access to knowledgeable witnesses for the reasons cited or by handicapping settlement discussions with a responsible party, like ProTechnics or a natural gas drilling company, because of concerns of disclosing the identity of witnesses.

89. DEP generated the withheld investigative records pursuant to its statutory authority cited in Paragraphs 82-83 of this Affidavit. The records reflect the ongoing, official, detailed probe DEP has made and continues to make, as authorized under law, into ProTechnics' compliance with its reciprocity license, specific license and license amendments.

90. Records withheld from Smith in response to his RTKL request as exempt under the noncriminal exception of the RTKL are also exempt records under the RTKL Public Safety and Security exceptions at 65 P.S. §§ 67.708(b)(2) and 67.708(b)(3), and under the RTKL Regulatory Preclusion to the Release of Records at 25 Pa. Code § 215.14(2), pursuant to Sec. 305(a)(3) of the RTKL, 65 P.S. § 67.305(a)(3) as outlined within this affidavit and the SW Regional Office's Exceptions Log.

April 18, 2016
Date


Barbara Bookser

**AFFIDAVIT
EXHIBIT A**

DEP EXCEPTIONS LOG

Smith v. Pa. Dep't of Env'tl Prot.

OOR Dkt. # AP 2016-0607

No.	Date	Record Description	Authors	Recipients	RTKL Exception
1	04/04/2007 – 02/01/2010	638 pages that include ProTechnics' application for reciprocity license; ProTechnics' application for specific license; ProTechnics' reciprocity license; ProTechnics' specific license; and ProTechnics' license amendments	ProTechnics (principally Radiation Safety Officers Ricky Kent and Will Williams)	DEP, Bureau of Radiation Protection (principally Radioactive Materials Licensing Chief John Chipppo)	PSS and RPRR
2	04/04/2007 – 04/29/2014	562 pages of correspondence between ProTechnics and DEP, Bureau of Radiation Protection, concerning ProTechnics' application for reciprocity license; ProTechnics' application for specific license; ProTechnics' reciprocity license; ProTechnics' specific license; and ProTechnics' license amendments	DEP, Bureau of Radiation Protection (principally Radioactive Materials Section Chief Ron Hamm and Radioactive Materials Licensing Chief John Chipppo), and Protechnics (principally Radiation Safety Officers Ricky Kent, Will Williams and Randy Shamblin)	DEP, Bureau of Radiation Protection (principally Radioactive Materials Section Chief Ron Hamm and Radioactive Materials Licensing Chief John Chipppo), and Protechnics (principally Radiation Safety Officers Ricky Kent, Will Williams and Randy Shamblin)	PSS and RPRR

List of Abbreviations:

- PSS refers to the Right-to-Know Law Public Safety and Security exceptions at 65 P.S. §§ 67.708(b)(2) and 67.708(b)(3).
- IPD refers to the Right-to-Know Law Internal, Predecisional Deliberation exception at 65 P.S. § 67.708(b)(10).
- RPRR refers to the Regulatory Preclusion to the Release of Records at 25 Pa. Code § 215.14(2), pursuant to Sec. 305(a)(3) of the Right-to-Know Law, 65 P.S. § 67.305(a)(3).
- NCI refers to the Right-to-Know Law Noncriminal Investigation exception found at 65 P.S. § 67.708(b)(17).

No.	Date	Record Description	Authors	Recipients	RTKL Exception
3	12/22/2009 – 01/09/2014	366 pages of emails discussing DEP monitoring of ProTechnics' operations and DEP's review of ProTechnics' license-required reports and submissions to assure ProTechnics' compliance with its reciprocity license, specific license and license amendments	Various DEP staff, including Bureau of Radiation Protection Director Dave Allard and Program Managers James Yusko and Dwight Shearer	Various DEP staff, including Bureau of Radiation Protection Director Dave Allard; Program Managers James Yusko and Dwight Shearer; and Program Supervisor Barbara Bookser	PSS
4	12/22/2009 – 01/09/2014	35 pages of DEP-internal emails discussing DEP plans and strategy for inspection, monitoring and enforcement to assure ProTechnics' compliance with its reciprocity license, specific license and license amendments	Various DEP staff, including Bureau of Radiation Protection Director Dave Allard and Program Managers James Yusko and Dwight Shearer	Various DEP staff, including Bureau of Radiation Protection Director Dave Allard; Program Managers James Yusko and Dwight Shearer; and Program Supervisor Barbara Bookser	PSS and IPD
5	12/22/2009 – 01/09/2014	26 pages of emails discussing various DEP investigative and examination activities to assure ProTechnics' compliance with its reciprocity license, specific license and license amendments	Various DEP staff, including Bureau of Radiation Protection Director Dave Allard and Program Managers James Yusko and Dwight Shearer	Various DEP staff, including Bureau of Radiation Protection Director Dave Allard; Program Managers James Yusko and Dwight Shearer; and Program Supervisor Barbara Bookser	PSS, RPRR and NCI

List of Abbreviations:

- PSS refers to the Right-to-Know Law Public Safety and Security exceptions at 65 P.S. §§ 67.708(b)(2) and 67.708(b)(3).
- IPD refers to the Right-to-Know Law Internal, Predecisional Deliberation exception at 65 P.S. § 67.708(b)(10).
- RPRR refers to the Regulatory Preclusion to the Release of Records at 25 Pa. Code § 215.14(2), pursuant to Sec. 305(a)(3) of the Right-to-Know Law, 65 P.S. § 67.305(a)(3).
- NCI refers to the Right-to-Know Law Noncriminal Investigation exception found at 65 P.S. § 67.708(b)(17).

No.	Date	Record Description	Authors	Recipients	RTKL Exception
6	01/06/2009 – 06/05/2010	14 pages of reports from DEP inspections conducted to assure ProTechnics' compliance with its reciprocity license, specific license and license amendments	DEP, Bureau of Radiation Protection (principally Inspectors C. Rittinger, James Hughes and Dwight Shearer)	DEP Inspection File	PSS, RPRR and NCI

List of Abbreviations:

- PSS refers to the Right-to-Know Law Public Safety and Security exceptions at 65 P.S. §§ 67.708(b)(2) and 67.708(b)(3).
- IPD refers to the Right-to-Know Law Internal, Predecisional Deliberation exception at 65 P.S. § 67.708(b)(10).
- RPRR refers to the Regulatory Preclusion to the Release of Records at 25 Pa. Code § 215.14(2), pursuant to Sec. 305(a)(3) of the Right-to-Know Law, 65 P.S. § 67.305(a)(3).
- NCI refers to the Right-to-Know Law Noncriminal Investigation exception found at 65 P.S. § 67.708(b)(17).

AFFIDAVIT OF DWIGHT SHEARER

I, Dwight Shearer, declare under penalty of perjury, pursuant to 18 Pa.C.S. § 4904, that the following statements are true and correct based upon my personal knowledge, information and belief:

1. I have worked for the Commonwealth of Pennsylvania, Department of Environmental Protection (DEP) for 21 years.

2. I presently serve as Program Manager for DEP's Radiation Protection Program (Program) in the Southwest and Northwest Regional Offices. I have served as the Program Manager since July 2013. My duties include the supervision and oversight, through subordinate managers, of all Program activities in the SW and NW Regions of DEP, including enforcement, registration and licensing.

3. The Program's mission is to ensure that public, occupational, and environmental exposure to radiation from man-made and controllable natural sources is as low as reasonably achievable.

4. Since 2008, the Program has inspected users of radioactive materials as part of an agreement with the U.S. Nuclear Regulatory Commission (NRC). In addition, it inspects all licensed and/or registered radiation-producing machines in Pennsylvania.

5. Throughout my career with DEP, I have actively assisted in searching for and retrieving records for both informal records requests and formal records requests made pursuant to the Right-to-Know Law, 65 P.S. §§ 67.101-67.3104 (RTKL), and its predecessor.

6. Presently, if the scope of a request for records falls within the purview of the Program, I help ensure that the Program responds comprehensively with a full inquiry into, and review of, all potentially responsive records possessed by the Program. Responsive records

Affidavit of Dwight Shearer

include, but are not limited to, paper records, electronic records, maps, sampling results, microfiche, photographs and video.

7. Given my responsibilities and experiences as Program Manager, I am familiar with the records stored within the Program, including where those records are located, how they are maintained and the Program personnel who might possess those records.

8. I am familiar with the February 1, 2016, Right-to-Know Law (RTKL) request filed by Kendra L. Smith (Smith), seeking records for Core Laboratories d/b/a Protechnics, Division of Core Laboratories, LP located at the Yeager Drill Site, McAdams Road, Washington, Pennsylvania, as follows:

- Any and all approvals, permits, licenses/licensures, applications for permits and/or licenses, reciprocity letters, reciprocity licenses, reciprocity agreements and/or reciprocity arrangements, including, but not limited to all licenses issued by the Department to Core Laboratories d/b/a Protechnics, Division of Core Laboratories, LP (hereinafter, "Protechnics") for use, storage and possession of radioactive materials and/or other licensed material. Additionally, this request seeks any and all investigation reports, Notices of Violation(s), Consent Order and Agreement(s) issued to Protechnics by the Department and/or between Protechnics and the Department for any and all work or services performed by Protechnics at any natural gas well site in the Commonwealth of Pennsylvania. Included in this request is a request for copies of all Notices of Violation issued by the Department to Protechnics, including but not limited to Notices of Violation dated June 15, 2010, January 28, 2010, November 26, 2013, September 13, 2013 and October 14, 2013, Violation Numbers 677913, 677915, 677914, 682834, 682833, 682829, 682835 and all corresponding inspection reports, field notes and other related writings. Further, this request seeks any and all Consent Order and Agreements between the Department and Protechnics, including, but not limited to, Consent Orders and Agreements dated November 2, 2013 and November 2, 2010.
- Copies of all enforcement activity taken by the Department against Protechnics, including but not limited to Enforcement ID Numbers 305057, 259202 and 263973, as well as all inspection reports completed by the Department regarding Protechnics, including, but not limited to, Inspection ID Numbers 1891418, 1919964, 2147772, 2204156 and 2221258.
- Any and all Radioactive Tracer Well Site Agreements made between Protechnics and any well site operator(s) for each and every well traced in the

Affidavit of Dwight Shearer

Commonwealth of Pennsylvania that is or was submitted to the Department, including, but not limited to, the April 7, 2013, Radioactive Tracer Well Site Agreement between Protechnics and a well operator.

- Any and all notifications submitted to the Department by Protechnics or the associated operator or subcontractor regarding Protechnics confirmation that licensed material, including, but not limited to, radioactive material, was returned to the surface at any well site in which Protechnics operated/performed work or services in the Commonwealth of Pennsylvania.
- Any and all documents, correspondence, e-mails and any other communication(s) between Protechnics and the Department and/or Range Resources and the Department regarding Protechnics and any and all work/services performed in the Commonwealth of Pennsylvania by Protechnics.
- Any and all MSDS/SDS (material data safety sheets and safety data sheets) in the possession of the Department regarding any and all products utilized by Protechnics at any well site in Pennsylvania, including, but not limited to, all MSDS/SDS for Protechnics Radioactive Tracer Products, as well as any and all Chemical Frac Tracer ("CFT") products, including, but not limited to, CFT 1000, CFT 1100, CFT 1200, CFT 1300, CFT 2000, CFT 2100, CFT 1900, CFT 1700.

9. I am also familiar with the February 3, 2016, amendment to the Smith request which sought "all drill sites in the Commonwealth including but not limited to the Yeager Drill."

10. Upon receipt and review of Smith's request, the SW Regional Office's File Clerk Jeffrey Brown determined that any records responsive to the request would fall within the purview of the Program. Brown advised Program employees of Smith's request. He requested that Program staff locate and collect responsive records.

11. The scope of the record search included checking files within the Program's file room, program staff offices, and electronically stored information. I spoke with staff in the Program who would possibly have responsive records in their custody, control, or possession.

12. After conducting its search, the Bureau determined that 1,641 pages of records responsive to Smith's request were in its custody, possession or control. The bulk of the Bureau's records pertained to licensing issues, and to a lesser extent, investigative matters.

Affidavit of Dwight Shearer

13. I reviewed the SW Regional Office's March 9, 2016, final response denying Smith access to 1,641 pages of responsive records. I am aware that Smith filed an appeal with the Office of Open Records from the denial of access made by each DEP office responding to her request, including the SW Regional Office.

14. I am familiar with the SW Regional Office's Exceptions Log that is attached as Affidavit Exhibit A.

15. The 1,641 pages of responsive records to which the SW Regional Office has denied Smith access are accurately described in the Exceptions Log.

16. For any records not provided, or not accounted for in the SW Regional Office's Exceptions Log, no other records exist in its custody, control, or possession.

17. The objective of DEP's licensing program is to ensure that radioactive material is used safely and disposed of properly, and that facilities are free from contamination when licensed operations cease.

18. On March 31, 2008, in order to more efficiently, uniformly, and safely control radioactive material, Pennsylvania entered into an agreement with the NRC to expand DEP's authority over the licensing and regulation of byproduct, source, and special nuclear material. A copy of the agreement is incorporated into this affidavit. *See Affidavit of David J. Allard, CHP (Allard), Attachment A¹.*

19. Operators are required to ensure that licensed material is used, transported, stored, and disposed of in such a way that members of the public will not receive more than 1 mSv (100 mrem) in one year, and the dose in any unrestricted area will not exceed 0.02 mSv (2 mrem) in

¹ I have read the affidavit of David J. Allard, CHP submitted in response to this appeal. For the sake of eliminating unnecessary duplication of attachments and records submitted on behalf of DEP, Allard's affidavit, and its attachments, are incorporated by reference into this affidavit where noted.

Affidavit of Dwight Shearer

any one hour. 10 CFR 20.1301(a)(1)-(2). DEP regulations must be at least as stringent as the Federal regulations, but not less. Federal standards were created with the understanding that there are natural background radiation levels. However, facilities that utilize radioactive materials or radiation producing machines are required to use practices, procedures, and control doses that are as low as reasonably achievable per 10 CFR 20.1101(b) to protect the general health and safety.

20. Operators are required to secure stored licensed material from access, removal, or use by unauthorized personnel. 10 CFR 20.1801. Operators are also required to control and maintain constant surveillance of licensed material when in use and not in storage. 10 CFR 20.1802. These Federal Regulations were created and adopted by DEP because it is imperative that operators maintain control of their materials and do not provide opportunities for unauthorized access or removal of their license materials. If these materials were not under constant surveillance, it is possible that they could be stolen and used with malicious intent to harm the public through the creation of a "dirty bomb" and provide unwilling radiation exposure to others. Exposure to high level radiation, even if it is still contained in the sealed source, can cause loss of limbs, narcosis, or death. The fact that a source is sealed does not mean that it is shielded to the extent that it would prevent a person from receiving radiation exposure.

21. Federal and state regulatory agencies maintain records of the amount and type of radionuclides used by licensees. Radionuclides are atoms that have excess energy that makes them unstable. This excess energy can create and emit (from the nucleus or electron orbits) new radiation, a new particle or photon, or transfer its excess energy to one of its sub-particles causing it to be ejected.

Affidavit of Dwight Shearer

22. The NRC, and approved state agencies, regulate the use of injected tracer radionuclides during hydraulic fracturing. DEP is an approved state agency.

23. ProTechnics offers services in the field of completion, reservoir, and drilling diagnostics. Completion diagnostic services use image and tracing services to provide direct measurements of a fracture height, zonal coverage, sand (or proppant) distribution, wellbore connectivity, and fracture fluid performance. Reservoir diagnostic services provide surveillance of injected fluid flow within a reservoir. Tracer services for a reservoir diagnostic surveillance are used in cases of a water flood, gas flood, steam flood, and surfactant flood. Drilling diagnostic services uses tracers to determine the amount of drilling fluid invasion in core samples and formation fluid samples that provide the following: the *in situ* solid waste and hydrocarbon saturations of a formation; the residual waste of a formation for log calibration purposes; and contamination in downhole formation fluid samples.

24. eFACTS is DEP's Environmental Facility Application Compliance Tracking System (eFACTS) that allows members of the public to search for authorizations, clients, sites and facilities. Users can also search the database to find inspection and pollution prevention visits as well as inspection results data, including enforcement information when violations are noted. DEP provides a name search to use when it is not known if the entity is a client, site, or facility.

25. The Program generated Inspection ID No. 1919964 in eFACTS as the result of its October 5, 2010 inspection of a ProTechnics temporary job site in Butler County, Buffalo Township. At the site, ProTechnics conducted a radioactive tracer study on one well; and a standard well logging study on a second well approximately 30 feet away. The Program

Affidavit of Dwight Shearer

Inspector examined this activity and reviewed documents Protechnics was required to hold on-site. The Program Inspector found no violations.

26. I am aware that DEP's Central Office and Southcentral Regional Office have taken enforcement action against ProTechnics.

27. To resolve DEP's enforcement actions, ProTechnics entered into a Consent Order and Agreement with DEP on November 2, 2010. *See* Affidavit of David J. Allard, CHP, Attachment D. The Consent Order and Agreement assessed a civil penalty of \$29,000 against ProTechnics and required the following corrective actions:

- A requirement that ProTechnics must provide a well site agreement to each well owner/operator to educate them of the proper procedures in the event of a flowback. Flowback is a water based solution that flows back to the surface during and after the completion of hydraulic fracturing;
- A requirement that ProTechnics must provide an instructional session to each well owner/operator that included radiation safety proper procedures for handling flowback incidents and disposal of radioactive residual waste;
- A requirement that ProTechnics must notify DEP when a flowback event has occurred and that it verified to see if any radioactive material returned back to the surface of the well;
- A requirement that ProTechnics must complete a survey and area sketch of the flowback area after the event occurred per the specifications of their emergency operating procedures;
- A requirement that ProTechnics must complete a formal report within 30 days of the flowback event and submit it to DEP;
- A requirement that ProTechnics amend its license to include the submission of a properly executed well site agreement with the well owner/operator within five business days of its completion;
- A requirement that ProTechnics amend its license to add a condition that would require it to coordinate with the well owner/operator to stabilize a pit used to bury radioactive residual waste for onsite decay so that the pit remained intact and did not wash out during weather events;

Affidavit of Dwight Shearer

- A requirement that ProTechnics amend its license to add a condition that it would at least annually inspect the area where the radioactive residual waste is buried to make sure it was intact, marked and fenced off;
- A requirement that ProTechnics immediately notify DEP upon confirming that radioactive material was contained in a flow back incident; and
- A requirement that ProTechnics amend its license to include the proper notification methods to DEP.

28. For DEP's noncriminal investigations noted in paragraphs 82 through 89 of this affidavit, DEP routinely performs the following general steps:

a. Upon receiving notification from a waste disposal facility, the Radiation Protection Program will request information from the facility about the load of waste, including but not limited to, the type of waste and volume; the isotope identified; the activity of the isotope; the generator of the waste; the identity of the person(s) who performed a radiation survey; the type of equipment used to survey the waste; the current location of the waste; and a determination from the facility of its plans for the waste load. Because each flowback incident might produce radioactive waste containing an isotope that does not meet established exemptions for municipal waste, it cannot be disposed at a landfill. Therefore, a U.S. Department of Transportation Special Permit is issued to reject the load and return it to its place of origin or designated place of destination.

b. If we investigate a flowback/loss of control incident at a site, the Program will contact the waste generator directly and/or assign a Radiation Health Physicist to investigate the flowback/loss of control incident, seek to identify all parties involved, and investigate how the loss of control of licensed material occurred. Whenever possible, the Radiation Health Physicist will document site conditions in a formal inspection report and possibly obtain photographs of the site.

c. Once completed, all documentation is submitted to Program Staff for review and approval of the inspection findings. Depending upon the severity of the violation, Regional Radiation Protection Management Staff will disclose inspection findings in accordance with its established Compliance and Enforcement Guidance Document. If additional information is needed prior to disclosing inspection findings, DEP will schedule a conference.

Affidavit of Dwight Shearer

Radiation Protection Act and Regulations

29. The General Assembly enacted the Radiation Protection Act because radiation exposure has the potential for causing undesirable health effects and the citizens of the Commonwealth should be protected from unnecessary and harmful exposure resulting from use of the radioactive materials, radiation sources, accidents involving nuclear power, and radioactive material transportation. 35 P.S. § 7110.102 and 25 Pa Code 215.1(a).

30. The purpose of the Act was to establish and maintain a comprehensive program of radiation protection within DEP; provide for licensing and regulations in cooperation with the Federal Government, other states agencies and appropriate private entities; to maintain a comprehensive radiation monitoring program; to maintain a technical emergency radiation response capability within DEP; and establish an emergency response program. 35 P.S. § 7110.102.

31. The Radiation Protection Act designated DEP as the agency of the Commonwealth with the authority to control radiation sources. 35 P.S. § 7110.301(a). DEP is also charged with developing and conducting a program to control and evaluate the hazards associated with radiation sources and radiation source users. 35 P.S. § 7110.301(c)(1).

32. DEP has the power and duty through the Radiation Protection Act to conduct studies and investigations relating to the control, regulation, and monitoring of radiation sources, and to collect and to disseminate information related to the control of radiation sources and the effects of radiation exposure. 35 P.S. § 7110.301(c)(12)-(13).

33. DEP has the statutory authority to enter a facility for the purpose of determining compliance with the Radiation Protection Act; any license conditions; or any rules, regulations, or orders issued under the Radiation Protection Act. DEP also has the statutory authority in an

Affidavit of Dwight Shearer

investigation to conduct tests, inspect or examine any radiation source records, or other physical evidence related to the use of a radiation source. 35 P.S. § 7110.305.

34. DEP's regulations promulgated under the Radiation Protection Act provides it with the authority to "enter the premises of a licensee" in order to conduct an investigation or inspection to ascertain whether the licensee is in compliance with the Radiation Protection Act and its regulations. 25 Pa. Code § 215.12(b)(3). Under this regulation, DEP also has the authority to conduct an investigation or inspection to protect health, safety, and the environment. 25 Pa. Code § 215.12(b)(3). This regulation includes the right of DEP to access records and other physical evidence, and requires a licensee to make a report or furnish information to DEP. 25 Pa. Code § 215.12(b)(1)-(2).

35. Section 215.14 of DEP's regulations, 25 Pa. Code § 215.14, provides, in pertinent part:

The following Department records are not available for public inspection, unless the Department determines that disclosure is in the public interest and is necessary for the Department to carry out its duties under the act:

- (1) Trade secrets or secret industrial processes customarily held in confidence.
- (2) A report of investigation, *not pertaining to safety and health in industrial plants, which would disclose the institution, progress or results of an investigation undertaken by the Department.*

(emphasis added). Put more clearly, if an investigation report does not pertain to the safety and health of industrial plants, it is not publicly available.

36. DEP interprets the reference to "industrial plant" in 25 Pa. Code § 215.14(2) as a building for carrying out industrial labor. DEP's interpretation of this term is consistent with the interpretation of the United States Government Accountability Office (GAO).

Affidavit of Dwight Shearer

37. I reviewed the affidavit of David J. Allard, CHP, Director of DEP's Bureau of Radiation Protection, regarding DEP's investigation of ProTechnics. His affidavit verifies that DEP's investigations did not involve an industrial plant. The well pads where the events took place resulting in DEP's investigation fell outside of the definition. Therefore, records relating to DEP's investigation of ProTechnics are not public under 25 Pa. Code § 215.14(2). The SW Regional Office acted in a manner consistent with this conclusion.

38. The SW Regional Office identified 1,641 pages of records related to ProTechnic's activities that are protected under the Radiation Protection Act and its regulations and are exempt from production as noted in this affidavit. These records are also exempt from production under the RTKL public safety and security records exception; the RTKL internal, predecisional deliberation records exception; the RTKL noncriminal investigation exception; and the Regulatory Preclusion to the Release of Records at 25 Pa. Code § 215.14(2), pursuant to Section 305(a)(3) of the RTKL.

Public Safety and Security

39. Radioactive materials files cannot be released to the public for public safety and security reasons. If the information contained in the radioactive materials files were released to the public and obtained by an individual with criminal intent, the public's health and safety could be severely compromised. An individual could potentially cause radioactive material to be widely dispersed resulting in greater environmental contamination and public exposure to radioactive material potentially leading to harmful health effects.

40. Furthermore, the release of this sensitive information could pose a potential threat to the personal safety of individuals employed in the use of radioactive materials. If ProTechnics

Affidavit of Dwight Shearer

or the well owner operator's personal contact information was released, a person with malicious intent could target them to obtain unauthorized access to radioactive material.

41. The health consequences related to unintentional exposure to radiation sources range from burns, nausea, vomiting, diarrhea, headaches, tissue and organ damage, narcosis, blindness, cancer and even death. These health consequences represent a significant potential harm to public safety.

42. DEP's radioactive materials files also contain information regarding the current location and quantity of radioactive materials possessed by licensees. Making this information available to the public presents a risk "reasonably likely to jeopardize or threaten public safety or preparedness or public protection activity." Location and quantity information, should it be publicly available, could be used by terrorists or other criminals who want to obtain radioactive materials or could create an increased threat to the licensee housing the materials thus making it a target of criminal activity. An increased threat would exist of exposing other persons to radioactive materials, and the associated health risks, after the materials were taken from the licensee.

43. DEP's radioactive materials files also contain information regarding the current location and quantity of radioactive materials possessed by licensees. Making this information available to the public presents a risk "reasonably likely to jeopardize or threaten public safety or preparedness or public protection activity." Location and quantity information, should it be publicly available, could be used by terrorists or other criminals who want to obtain radioactive materials or could create an increased threat to the licensee housing the materials thus making it a target of criminal activity. An increased threat would exist of exposing other persons to

Affidavit of Dwight Shearer

radioactive materials, and the associated health risks, after the materials were taken from the licensee.

44. Individuals have manipulated the information contained in a radioactive materials license and other files to unlawfully obtain radioactive materials and use those radioactive materials to harm the public. The sensitive nature of the subject matter contained in all radioactive materials files provides an individual insight into the radioactive materials license application process and the documentation needed to fraudulently obtain radioactive materials. This insight includes what a radioactive materials license looks like, the type of training licensees must complete as required by DEP, specifics regarding radiation protection programs, and internal DEP tracking numbers.

45. There are documented cases of regulatory agencies approving license applications from fictitious entities that then fraudulently obtained radioactive materials. *See Allard Affidavit incorporated Attachment G: Nuclear Security: Actions Taken by NRC Strengthens Its Licensing Process for Sealed Radioactive Sources are Not Effective*, Government Accountability Office (2007); Kathleen Day, *Sting Reveals Security Gap at Nuclear Agency*, The Washington Post, July 12, 2007; and David Kestenbaum, *GAO Sting Uncovers Nuclear Security Shortcomings*, NPR, July 12, 2007.

46. These articles highlight the nexus between the disclosure of radioactive materials license files and the realistic scenarios DEP is seeking to avoid. By withholding radioactive material files, DEP hopes to thwart individuals with malicious intent in the first instance. As a direct result of exempting these records as permitted under the RTKL, these individuals will lack the basic information required to prepare fraudulent documents and obtain radioactive materials