

Jefferson Parkway Advisory Committee (JPAC)
May 17, 2018
Meeting Summary – FINAL
Apex Field House (5724 Oak Street, Arvada, CO 80002)

PARTICIPATION

Participants: Bini Abbott, Bill Branyon, Ian Owens, Rebecca Kallio, Britta Nelson, Jill Straus, Bill Ray, Randy Stafford, Jerry Taylor, Brett Vernon, Marc Wills

Speakers: Kristen Iversen, Jon Lipsky, Lindsay Masters, Carl Spreng, Mike VanDyke,

Facilitation: Heather Bergman, Sam Haas

MEETING PURPOSE

- This meeting was video recorded, and the JPAC Committee agreed that the recording would not be shared or posted unless agreed upon by the Committee.
- Each speaker was allotted 25 minutes. They were given the opportunity to choose to present for as long as they would like within that 25 minutes, and the remaining time was provided to JPAC Committee members to ask clarifying questions. Debate or engagement amongst the presenters was discouraged. Any written public comments are included in the meeting summary.
- Please note, this meeting summary reflects the perspectives articulated by the individual panelists and individual JPAC members. The perspectives vary and not everyone agrees with all the statements that were said.

LINDSAY MASTERS PRESENTATION

Lindsay Masters, Environmental Protection Specialist for Colorado Department of Public Health and Environment’s (CDPHE) Hazardous Waste Corrective Action Unit, provided information on the background of Rocky Flats and the legal and scientific history of the site.

- The present Rocky Flats site is south of Boulder and north of Arvada and Denver. During the Cold War, the US was creating a buildup of global warheads, and Rocky Flats was a plutonium pit production site for nuclear weapons. It was a large facility, and the “protected area” was where the plutonium production occurred. Rocky Flats was one of the worst environmental sites in the country. A lot of drums were stored on the mesa and leached plutonium into the surface soil.
- The environmental law history of the Rocky Flats Plant is complex. After World War II, the Atomic Energy Act was passed, which created the Atomic Energy Commission (now the US Department of Energy). In 1951, the Rocky Flats plant was constructed. From 1952 to 1989, the plant produced plutonium triggers during the Cold War; there were environmental releases on- and off-site and two major fires. In 1976, the Resource Conservation and Recovery Act (RCRA) was passed (called the “cradle to grave” regulation for hazardous waste). In 1980, the Comprehensive Environmental Response and Liability Act (CERCLA or “Superfund”) was passed. This was a retroactive law, meaning that parties could be held responsible for past acts.

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- In 1983, the Environmental Protection Agency (EPA) created the first National Priorities List (NPL). In 1986, several amendments were made to CERCLA. Section 120 amendments required federal facilities to comply in the same manner as other non-governmental entities and required federal facilities on the NPL to have an interagency agreement with the EPA (and the state, if the state so desired).
- In 1986, an interagency compliance agreement was reached for Rocky Flats with the goal of bringing Plant operations into compliance. Plant operations slowed in 1988, and in 1989 the EPA and FBI raided Rocky Flats and the site was added to the NPL.
- In 1991, a new interagency agreement was created to reflect the change from a compliance mission to a plan to close and clean up the facility. In 1992, the operator got an \$18.5 million fine for environmental crimes. In the early 1990's, federal and state governments entered environmental battles and many questions got answered, specifically around federal and state immunity and state authority.
- From 1991 to 2005, there was a CERCLA environmental investigation, sampling, and cleanup of Rocky Flats. In 1996, the cleanup model evolved and the Rocky Flats Cleanup Agreement (RFCA) was negotiated. By 2001, the cleanup had progressed and Congress passed the Rocky Flats National Wildlife Refuge Act, defining the end use of the lands that met applicable standards and action levels.
- Physical closure of the site occurred in 2005. The Corrective Action Decision/Record of Decision was approved in 2006, which outlined the site remedy for two sections: the Central Operable Unit (COU) and the Peripheral Operable Unit (POU). The term "operable unit" is used to break down large sites into manageable pieces for investigation.
- The cleanup took over ten years and cost \$7 billion. About 800 structures were deactivated, decommissioned, and demolished. 421 potentially contaminated areas were investigated, and 360 were remediated. It was the largest CERCLA cleanup at the time. Refuge and offsite areas were also investigated. Arsenic, benzo(a) pyrene, dioxin, plutonium, and vanadium were identified as contaminants of concern. The activities were overseen by the Department of Energy (DOE), EPA, CDPHE, and the Defense Nuclear Facilities Safety Board (DNFSB).
- During the cleanup, drums were removed, contaminated soil was excavated (within a tent in some cases) and the waste was packaged and handled and shipped off site to a variety of different disposal sites across the country in the DOE Complex. The COU is still DOE retained, and the POU includes the wildlife refuge, part of which became the right of way for the Jefferson Parkway.
- Following the closure of the site in 2006, a post-closure agreement was created in 2007 (the Rocky Flats Legacy Management Agreement). In 2007, the EPA de-listed the POU from the NPL and it was transferred to the US Fish and Wildlife Service. The COU is subject to mandatory five-year reviews of the CERCLA remedy, which includes analysis of toxicity factors and exposure assumptions to determine whether the remedy was functioning as intended. These reviews have found that the remedy is still protective of human health and the environment. There is ongoing monitoring and maintenance of the remedy, including reviews, site visits, and groundwater treatment systems.

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- CDPHE is bound by laws and regulations. These laws, regulations and policies govern how CDPHE applies numerical standards, a process which is not unique to Rocky Flats. Remediation of Rocky Flats met applicable legal and regulatory requirements. The COU was remediated to the CERCLA risk range, per regulations. The Refuge/right of way was not remediated because detected levels were so low the land did not meet the threshold for action. Environmental regulatory standards are health-based, not background based.

CARL SPRENG PRESENTATION

Carl Spreng, representative from CDPHE's Hazardous Materials and Waste Management Division, presented on the health-based environmental standards and risk calculations.

- The EPA's Integrated Risk Information System (IRIS) looks at toxicology and chemistry regarding various chemicals' human health effects and provides assessments of hazards that are then used in decision-making and site risk assessments nationwide.
- Risk assessments can consider different exposure scenarios, doses, adult and child biology, animal biology, chemical hazards, and behaviors.
- Data and records related to the Rocky Flats cleanup is available online on the DOE, CDPHE, and EPA websites. Older records are hard copy and are being transferred into the electronic database.
- There is on- and off-site residual contamination within the regulatory limits. Agencies continue to monitor and remedy the site. There have never been conditions to justify a CDPHE penalty under RFLMA. Calculated radioactivity levels are well below regulatory standards. The average residual plutonium contamination in the surface soil in the COU is 2.3 picocuries (pCi) per gram, which equates to less than one mrem (the dose) per year and a less than one in a million risk of excess cancer.
- The state radioactivity standard placed a dose limit of 25 mrem/year above background, and the calculated doses for plutonium exposure in the most contaminated area of Rocky Flats is .3 mrem/year for an adult refuge worker, .2 mrem/year for a child visitor, and .7 mrem/year for an adult visitor. In terms of total effective dose equivalents (TEDEs), eating one banana can lead to a .01 mrem, an airplane flight from Denver to Juneau, AK can result in 1 mrem. The Chernobyl accident resulted in a high dose of more than 80,000 mrem.
- The exposure pathways that were considered in the risk assessment were inhalation, ingestion, dermal absorption, injection, and external irradiation. For plutonium, the primary exposure pathways are inhalation and ingestion. The risk assessment assumed that the wildlife refuge workers worked approximately 230 days/year for 18.7 years and that the wildlife refuge visitor visited 100 times per year for an average of 2.5 hours per visit, and had a soil ingestion rate of 60 mg/day.
- Cancer is possible, but not probable (small risk) if exposures to ionizing radiation are small. Regulations provide limits below which risk/dose is negligible. The linear no-threshold dose model is linear and assumes that the higher the dose, the greater the effects. The risk of getting cancer from inhaling one particle of plutonium is not

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zero, but it is very small. Plutonium is a global contaminant; it is everywhere and millions of dust particles contaminated with plutonium must be inhaled to result in significant radiation doses.

- Rocky Flats is very well studied. The CERCLA environmental investigation produced a lot of data. Informed decisions were made based on employee interviews, records, and process knowledge. Thousands of samples (air, soil, groundwater, surface water, and sediment) were collected on- and off-site.
- To address the question of whether Jefferson Parkway construction would release harmful levels of plutonium, it is important to understand that the 300-foot right of way along Indiana was granted in the Refuge Act. The environmental investigation concluded that both the Refuge area and the off-site areas were suitable for unlimited use and unrestricted exposure. A lot of soil sampling took place in the right-of way. The maximum right of way plutonium concentration was 8.8 pCi/gram and the average right of way plutonium concentration was 1.4 pCi/gram. Third-party sampling east of the right of way agrees with the DOE sampling results.
- Federal standards for airborne radionuclide emissions set a 10 millirem/year dose limit. Colorado radiation standards limit the public to a total annual dose above background of 25 millirem/year. Continuous surface water measurement at Rocky Flats is measured against an extremely sensitive/conservative standard of .15 pCi/gram.

Clarifying Questions

Participants asked clarifying questions about Carl Spreng's presentation. Questions are indicated in italics, followed by the response.

How exactly has the ongoing soil testing been done?

Trenches were studied inch by inch and thousands of surface soil samples were collected and sent off to labs. Surface soil samples are collected with stainless steel trowels. Sub-surface samples range from six inches deep to 50 feet deep. Those samples were collected from bore holes or by trenching with a backhoe.

If there were contaminants at Rocky Flats, how would you expect them to travel, and where would you expect to find them?

It would depend on the contaminant. Some contaminants are mobile. The Actinide Migration Panel (which was comprised of experts from the School of Mines and other universities as well as national labs) discovered that, as soon as plutonium is in the environment, it latches onto oxygen and attaches to soil particles. It travels as those soil particles travel. It does not migrate in the subsurface and is essentially insoluble. Uranium does travel in the subsurface, which is why there are groundwater wells to look under the surface soil. Major weather events may mobilize the remaining contaminants.

What were the results of the monitoring from the construction occurring now between 86th and 91st on Indiana Street?

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No monitoring has been done specifically for this construction; CDPHE does not have requirements that would drive that. Previous off-site sampling does indicate that plutonium concentrations are at or below background in this area. The average samples within the 300-foot right of way are also well below levels of concern. There is a statute from 1972 that requires any soil that measures above 1 pCi/gram to be assessed by the radiation control program at CDPHE. They have been notified about the construction, and if they required anything it would be dust suppression. The levels are well below the trigger points for evaluation.

Conversely, according to panelist Jon Lipsky, the Jefferson County land-use development regulations include a list of regulations that should be followed, but Candelas did not follow it and Three Creeks School did not follow it. Broomfield has no radiation guidelines so they default to the State's guidelines.

MICHAEL VAN DYKE PRESENTATION

Mike Van Dyke, Branch Chief of the Environmental Epidemiology, Occupational Health, and Toxicology (EEOHT) branch at CDPHE, provided an overview of CDPHE's cancer-related studies conducted at Rocky Flats.

- Men have a one in three lifetime risk of getting cancer, and women have a one in four lifetime risk. Cancer is not a single disease; it is a group of 100 different diseases. It is the second leading cause of death in Colorado.
- The risk factors are different for each kind of cancer but include old age, family history/genetics, tobacco use, sun exposure, hormones, alcohol use, infections, diet, obesity, and lack of physical activity. Relatively few cancers are definitively linked to environmental or occupational exposures. Risk depends on the amount and duration of exposure, and it is not easy to separate chemical exposure risk from other risk factors.
- When studying cancer, the goal is to consider a specific area (in this case, Rocky Flats), and compare it to another area (in this case, the Denver metro area) to determine whether the people living in the neighborhoods near Rocky Flats have a higher risk of getting cancer.
- The original Rocky Flats Cancer Registry study looked at data from between 1980 – 1989, and the second study looked at data from 1990 – 2014. The studies compared incidence of cancer in the areas surrounding Rocky Flats to the remainder of the Denver metro area. The study analyzed ten cancer types (esophagus, bone, stomach, leukemia, colon/rectum, lymphoma, liver, brain/nervous system, lung, prostate). These cancers were selected because they were potentially tied to plutonium exposure or recommended for study by Health Advisory Panel members.
- The 1998 report found that 186 out of the 190 cancer rations tested indicated no significant difference from the remainder of the metro area. There were four significant findings: lung cancer was elevated in Adams-West and Northglenn/Thornton; colorectal cancer was elevated among males in Wheatridge, and brain/CNS cancer was elevated among females in Arvada. The 2016 report found no differences for stomach, liver, bone, leukemia, lymphoma, and

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brain/central nervous system cancers, but resulted in eight significant findings: lung cancer was elevated in Arvada, Adams-West, Adams-Clear Creek Valley; Colorectal cancer was elevated among males in Adams-West, Adams-Clear Creek Valley (these neighborhoods also have a higher rate of smokers than the metro area); esophagus cancer was elevated among females in Golden; prostate cancer was elevated in Boulder County (which makes sense because more affluent populations tend to screen better).

- In 2017, a supplement study was done to assess thyroid and “rare” cancers. There were no significant differences except a higher-than-expected percentage of males in Wheatridge with pancreatic cancers.
- The findings indicate no clear trend of elevated cancer incidence that would suggest environmental exposure. Most of the elevated cancer findings (lung, colorectal, esophagus) have tobacco use as a major risk factor. Most of these cases had a history of tobacco use, and the locations of these elevated cancer incidence had higher rates of tobacco use compared to the rest of the metro area. The studies do not suggest potential plutonium exposure or living in the vicinity of Rocky Flats has significantly increased the risk of cancer for residents.

Clarifying questions

Participants asked clarifying questions about CDPHE’s presentations. Questions are indicated in italics, followed by the response.

How long does it take for symptoms of plutonium-related cancers take to show up?

In general, cancer is a disease of long latency (10-20 years out).

Why did CDPHE’s studies include regional statistical data for areas that are not close to Rocky Flats (e.g., Boulder)?

The Health Advisory Council decided what areas to study. They were looking at all the surrounding neighborhoods.

Did the interviewers of the cancer study ask the subjects how long they had lived in that area?

To be clear, cancer study subjects were not interviewed. This information was collected from the Colorado Central Cancer Registry. A weakness of these types of studies is that a cancer gets reported to the registry based on the current address. People who used to live somewhere else who now live in the study area get reported, and people who used to live in the study area but now live elsewhere do not get reported.

Who was the liable party for the environmental crimes fine?

The fine was paid by the contractor, Rockwell. From 1977 forward, DOE had control of the site. DOE was responsible for the cleanup. The Federal Facilities Act was passed in 1992. It amended RCRA to waive federal immunity from state penalties. CERCLA Section 120 says that federal government agencies are held to same standards as other entities.

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Have there been other studies on non-cancerous exposure and diseases?

There have been studies on workers, but not on residents.

What if the regulatory limits are wrong and are not conservative enough?

The standards are based on decades of studies. The mandatory 5-year reviews look for any changes to standards that are based on those studies.

Does the settlement area for the class action lawsuit (Cook v Rockwell) overlap as the study area from the CDPHE cancer studies?

No, the area included in the class action lawsuit was based on the 1970 Krey-Hardy map. All of CDPHE's cancer studies are online. There is a map with data and summaries.

JON LIPSKY PRESENTATION

Jon Lipsky, retired Federal Bureau of Investigation (FBI) agent, who led a raid on Rocky Flats in 1989, shared a presentation about the contamination along the Indiana corridor from Rocky Flats.

- Lipsky introduced himself with a Disclosure, summarized his involvement regarding the Rocky Flats Nuclear Weapons Plant (Rocky Flats), and contended that the standards for clean-up did address the hazards to humans. Lipsky has a master's degree in criminology, law, and society. He worked as a police officer in Las Vegas after college then as an FBI agent. In 2005, he became a private citizen. Various federal laws and rules constrain him from completely disclosing all information about the Rocky Flats criminal and special federal grand jury investigations, and he has been threatened with contempt violations regarding his 1992 Congressional and 2005 Marilyn Cook testimonies.
- Lipsky collaborated in writing a book called "*The Ambushed Grand Jury*" published in 2004. It was written in contestation of the designation of the wildlife refuge, which was part of the right-of-way for the Jefferson Parkway. He is an advocate for releasing the special federal grand jury documents to the public. Lipsky testified as a subject matter expert in the 2005 Marilyn Cook trial and in 2010 before for the Colorado State House for the Informed Consent Bill with Colorado Representative Wes McKinley. He collaborates with the University of California, Irvine; Rocky Flats Nuclear Guardianship; University of Colorado Archives' - Atomic West Project; and, Rocky Flats nuclear worker advocates.
- The 1987 FBI/EPA predication for a federal criminal investigation at Rocky Flats was the Mary L. Walker briefing memo from 1986 which states, in part, "that some of the waste facilities are patently "illegal." (1986: Barton, John: p. 4 at <https://rockyflatsambushedgrandjury.com/wp-content/uploads/1987-Mary-L-Walker-Briefing-Memo.pdf>).
- A short segment of the [December 15, 1988 thermal imaging aerial videos](#) taken of Rocky Flats before the FBI raid was presented. It was sub-freezing (seven degrees Fahrenheit) with snow on the ground. The video shows thermal activity near the 207 Solar Evaporation ponds, Pond B-3 on South Walnut Creek and East Spray Field runoff to Woman Creek. The federal criminal investigation concluded in 1992 with

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the Rocky Flats contract operator pleading guilty to illegally utilizing a closed 207 Solar Evaporation Pond, violating Pondcrete storage regulations, and operating the Spray Fields (resulting in runoff of Rocky Flats contamination).

- The solar evaporation ponds were closed in 1985 by CDPHE. Rockwell utilized the solar ponds contrary to regulatory authority and contaminants leaked into the groundwater and resurfaced in North Walnut Creek, flowing into the Great Western Reservoir, which polluted drinking water supplies for Broomfield.
- The sludge in the solar evaporation ponds was mixed with Portland cement. The resulting “pondcrete” was stored on the 750 Pad and leaked into South Walnut Creek. The [spray irrigators](#) at Rocky Flats ran 24/7, 365 days a year. The rows of sprayers operated outside of the industrial area, and the spray irrigation was done on the west side of the plant as well. Rockwell knew that they were not supposed to [spray over the east trenches](#), but they did. They recharged the burial sites, which caused underflow, resurfacing, and offsite flow.
- The Jefferson Parkway was conceptualized in the 1960’s. Since that time, questionable waste burial practices, undocumented waste sites, fires, criticalities, and accidents at the site have become publicly known. There have been various studies conducted, including the Ed Martell (National Center for Atmospheric Research) study and [Krey-Hardy \(US DOE\)](#) studies that created a contour map of (weapons-grade) plutonium (239) in surface soils extending over a large area to include the planned Jefferson Parkway. Times have changed, and the present configuration of the Jefferson Parkway should no longer be considered.
- Rocky Flats and its original buffer zone was 2,200 acres and there was no east entrance off Indiana Street from 1951-1975. Following the 1969 Rocky Flats fire and Marcus Church lawsuits the Rocky Flats buffer zone was increased to 6,500 acres. The Jefferson Parkway’s right-of-way area (post-1975 Rocky Flats buffer zone) was also a superfund site, which was delisted in 2007. In 2007 the 20,000 off-site acres, including a portion of Candelas, was delisted as a part of the Rocky Flats superfund site. The contractor clean-up of the 2007 delisted sites were without an independent verification and no clean-up action was taken.
- From 1999-2003, CDPHE conducted a buffer zone contamination review with the DOE. The public reports indicate 28 Areas of Concern resulted in no further action and 25 Areas of Interest were not addressed. Over 80 million gallons per year of Rocky Flats effluent flowed from Rocky Flats to Pond B-3 (South Walnut Creek) then spray irrigated, some of which was runoff to Walnut Creek to the Great Western Reservoir and Woman Creek to Stanley Lake. Sludge was buried in the original landfill (OLF) until 1968, after 1968 to the present landfill (PLF).
- A nuclear worker from Rocky Flats stated that “standards for cleanup do not address the hazards for humans.” Only the environmental samples on or after June 28, 2001 were considered for the Comprehensive Risk Analysis (CRA). Environmental samples from the 1986 CEARP, 1987 RCRA Part B Permit (important regulatory decision that allowed Rocky Flats to operate) and the June 1989 FBI/EPA search warrants were not considered for the CRA. The CRA is the basis for the EPA

and CDPHE to designate Rocky Flats safe or. The EPA and CDPHE determination of “safe” is a failed concept.

- There are in-place subsurface features such as pits, trenches, and landfills that need independent verification (specifically trenches one and two). The DOE believes that animals do not burrow below eight feet, even though prairie dogs have been known to burrow 16 feet, worms to 32 feet. Actinides do not remain in place during large storm events, even though DOE has stated otherwise.
- The Jefferson Parkway should not be built through any part of Rocky Flats, and Rocky Flats workers deserve their own unique compensation programs.

Clarifying Questions

Participants asked clarifying questions about Jon Lipsky’s presentation. Questions are indicated in italics, followed by the response:

What was the purpose of the spray irrigation field?

The purpose of spray irrigation fields was to disperse the effluent from Rocky Flats for soil percolation and solar evaporation without runoff to the creeks or offsite.

What was the reason for the expansion from 2,200 to 6,500 acres?

The Church family, previous land owners, were provided cattle grazing rights near Rocky Flats. Rocky Flats activities and operations caused harm to the cattle and public disclosure of Rocky Flats contamination in the 1970s resulted in federal lawsuits over property devaluation. The Church family was compensated over \$9 million in 1985 to resolve the federal lawsuits.

KRISTEN IVERSEN PRESENTATION

Kristen Iversen, author of *Full Body Burden: Growing up in the Nuclear Shadow of Rocky Flats*, presented on the public health implications related to Rocky Flats.

- Iversen is a professor, writer, and journalist. She holds a PhD from University of Denver and has taught around the country. She now is the department head for a PhD program in nonfiction at the University of Cincinnati. She was born in 1958 and grew up near Rocky Flats. When she was ten years old, her family bought a second house in Arvada, closer to Rocky Flats. She rode horses up and down Indiana Street and swam in Stanley Lake. Nearly every household in her neighborhood had a case of cancer. (Kristin Haag, the daughter of the builder Rex Haag, was diagnosed with bone cancer at age 11 and died a month after her leg was amputated; a young boy who lived next to her was diagnosed with testicular cancer and they moved away; a school friend’s family—the Smith family—lived off the land and every child had health issues, including brain cancer). Iversen’s family had several cancer diagnoses, autoimmune diseases, and other diseases that originated from the toxic poisons that entered the air, water, and soil from Rocky Flats.
- By 1968, there had already been over 200 fires at Rocky Flats and there was never a public warning or evacuation or even any information provided to the public. When her parents bought their house in the Brideldale neighborhood, they had to sign an

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advisory notice acknowledging the fact that there was plutonium in the soil and that there was an associated health risk. No offsite clean-up was conducted.

- As a writer, Iversen met with managers at Rocky Flats and prepared reports that were sent to Albuquerque, Washington D.C., and other DOE offices. Her book *Full Body Burden* was heavily fact-checked by people both within and outside of the nuclear industry. She interviewed workers, DOE officials, Rocky Flats officials, residents, etc. Since the release of her book, she has received many emails and letters. Below are quotes from several of the letters:
 - “I grew up in Arvada, went to Fitzmorris Elementary, and graduated from Arvada West. We played in Ralston Creek. There were approximately 80 kids in my grade; we are all in our early fifties now. Of the 20 or so I have kept track of since high school, my own son was diagnosed with testicular cancer at age 19 (in 2009), and a friend's son is a leukemia survivor. Another friend's sister died of brain cancer in her 20s; another's sister is battling her third recurrence of ovarian cancer; and one friend's father, a Rocky Flats worker, died of brain cancer. Aside from the father, all were diagnosed before age 40. We are all longtime Arvada residents.”
 - “My family grew up across 80th from Meadowgate and our closest friends still live in Meadowgate. I just turned 34, and my parents moved into their current house near Sierra Elementary when I was 6 months old. I am the youngest of three; my brother will be 40 this year and my sister will be 38. My brother was diagnosed a few years ago with M.S. My father was diagnosed with Parkinson's a year later. In 2012, I found a tumor in my thyroid that they thought was cancerous, so I had a full thyroidectomy. My sister had surgery for breast cancer and she has another surgery next week. Then, in January of this year, my mom was diagnosed with leukemia. As you can imagine, we are asking ourselves what is going on.”
 - “I am a local veterinarian. My daughter, age 52, is currently processing through stage four brain cancer and is in hospice. She has lived her entire life in Golden and Arvada; she lived with their two children on a ranch in an open field of 100 acres near Rocky Flats where it was constantly windy. Her husband died in July 2012 of brain cancer after a two-year battle. My husband was born and raised in Denver and had several veterinary clinics in California and Colorado. He took over a veterinary clinic in Arvada near Rocky Flats when the owner was diagnosed with lymphocytic leukemia and died. He [the husband] was amazed to see the alarming number of cancer cases in animals. It was so much higher than average that he asked other local veterinarians about it and they seemed to think that the incidence was yes, unusually high, but normal *for that particular area.*”
 - “My uncle lived near Rocky Flats and my father lives in Westminster. My father had testicular cancer a couple of years ago and was recently diagnosed with Primary CNS diffuse large b-cell lymphoma. He had a brain tumor removed a couple of weeks ago, and now he is undergoing extensive chemotherapy treatments for the next couple of months. We do not

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understand it; he always took care of his body. There is much unexplained illness in our family.”

- We live in Candelas. My young daughter was diagnosed with AML leukemia when she was 11 months old. She is now 17 months old and we are still in the hospital fighting for her life. She relapsed in December. Now we are trying to get her back into remission so that she can have a bone marrow transplant.”
- “I left Colorado in late 1995 and returned in 2001. I was stunned by the huge amount of development around Stanley Lake. After hearing my reaction to the development, my realtor whispered that her grandmother had moved to a property near the lake a few years earlier with her three dogs and that within three years, the dogs were dead.”
- “We live near Rocky Flats and we got a wonderful yellow lab. As a puppy, dug in the yard where she buried her bones. She developed cancer in one of her hind legs, which was amputated. The expectation from the vet was that she would have at least another year-and-a-half with us. Sadly, the cancer spread quickly and we had to have her euthanized.”
- “There used to be a turkey farm called Jackson Turkey Farm. The family that owned the farm talked about DOE raids on the farm. They would show up and test the turkeys and tell the families not to tell anyone. I wonder what happened to the data about those turkeys.”
- “We just bought our house from the original homeowners. At no point during the home-buying process did anyone tell us about Rocky Flats. We want to move now. We do not want to raise our children here.”
- There are a lot of new grassroots organizations and a growing effort to face what has happened at Rocky Flats. It has been frustrating to receive all these messages and not be able to point the people to any resources or offer any help; these people have been systematically silenced.
- The Rockwell lawsuit represented over 13,000 people who believe that their health was impacted by Rocky Flats. The pattern of illness indicates that the population at Candelas should be tracked closely. There is no public health monitoring or medical assistance/hotline offered for these people. These stories are too persistent and consistent to be perceived as just anecdotal or emotional. The initial results of the downwind health study showed health impacts tied to the plume patterns from the 1950’s and 1960’s. Plutonium has a half-life of 24,000 years. This issue will not go away or decrease over time.

Clarifying Questions

Participants asked clarifying questions about Kristen Iversen’s presentation. Questions are indicated in italics, followed by the response.

Is Iversen working on other projects related to this work?

There has been an international response to *Full Body Burden*. Iversen is working on a new book titled *Doom with a View: The History and Legacy of Rocky Flats*. It presents 14

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articles/essays by professionals, writers, and scientists (some are within the nuclear industry, and some are not). The book presents a spectrum of perspectives related to Rocky Flats. It will be released within the next year. *Full Body Burden* is being made into a documentary which will be released on May 1, 2019. There is also an art exhibit by Jeff Gipe on Rocky Flats. He captures some of the only honest signage from Rocky Flats.

What are Iversen's thoughts on CDPHE's cancer studies, presented by Van Dyke?

There are good things about the studies, and there are serious flaws in the studies. Some of the information contradicts other valid studies. Doctor Carl Johnson was the first health director of Jefferson County to oppose development near Rocky Flats. He was fired from his job for trying to prohibit home development within ten miles of Rocky Flats and had contamination and health data to support his case. He later won a whistleblower lawsuit against Jefferson County on this matter.

NEXT STEPS

- Peak Facilitation will work with the speakers to ensure that the summary accurately captures their presentations.
- At the next meeting, Bill Ray will present the results from the cost and traffic feasibility study presentation to the Jefferson Parkway Public Highway Authority (JPPHA) Board meeting. He will also present an update from the May and June Board meetings. Then the JPAC will take stock of what they have learned thus far and discuss potential recommendations they would like to consider making to the JPPHA Board.
- CDPHE will provide additional information about Indiana Street (how often it has been updated, what the fill is, plutonium levels, etc.). CDPHE will also provide a report of the soil sampling that occurred along the 300-foot buffer and whether the sampling occurred to the same depth that the road excavation would incur.

PUBLIC COMMENTS

Sasha Stiles

- As a physician who cares about the health of the community, I am extremely worried about wind and soil displacement with any highway construction anywhere around the proposed bypass. Please do not just review the CDPHE data; epidemiologically, it is very suspect. Their methodologies for collecting samples and sampling techniques are not epidemiologically sound. Randy Stafford (JPAC member) has reviewed 12 soil studies and six medical studies. Why does CDPHE not acknowledge these studies? Their presentation gave sweeping proclamation without dates or location or sampling of anything. There should be review of these studies and not just reliance on CDPHE.
- The Jefferson Parkway should avoid Rocky Flats altogether. The road could go due west parallel to 128, intersecting with 93, then south on the west side of 93.
- I am not a "radical, rigid extremist." I have an MPH from Berkley and an MD from UCSF Tufts Medical Center and the University of Hawaii Medical Center. Although I am not boarded in epidemiology specifically, I know when elements are not

Please note, this meeting summary reflects the perspectives articulated by the individual panelists and individual JPAC members. The perspectives vary and not everyone agrees with all the statements that were said.

carefully defined. The CDPHE studies do not follow any of the strict epidemiological guidelines in their sampling techniques that my universities would require. If you get the sample wrong, the data is suspect. I have met with many cancer patients in the downwind populations; please err on the side of caution and place the Jefferson Parkway out of harm's way.

Anonymous Comments

- Of all the data provided by CDPHE tonight, only two data points are pertinent: 1) Actual contamination along Indiana Street right-of-way: there are reliable scientific studies that directly refute the contamination data of CDPHE and cannot be ignored. 2) Risk of inhalation of airborne contaminated particles goes up in proportion to the actual contamination—this is not some statistical average!
- The majority of participants in the CDPHE cancer incidence study did not live in the downwind exposure area; CDPHE also did not account for latency periods of plutonium-related cancers.
- Since extensive public health studies of downwind residents have never been done, there is no way to verify the safety of the standard CDPHE used to declare the wildlife refuge and right-of-way along Indiana. The risk of exposure due to the Jefferson County Parkway construction for current and future residents will be based on the recommendation now.
- To all JPAC members: Have you read Randy Stafford's position paper and/or the science it references? If not, are you qualified to make a decision on the question of contamination?