MINUTES OF THE

THE CITY OF SANTA FE & SANTA FE COUNTY

BUCKMAN DIRECT DIVERSION BOARD MEETING

October 6, 2011

This meeting of the Santa Fe County/City Buckman Direct Diversion Board meeting was called to order by Virginia Vigil, Chair, at approximately 4:00 p.m. in the Santa Fe City Council Chambers, 200 Lincoln Avenue, Santa Fe, New Mexico.

Roll was called and the following members were present:

BDD Board Members Present:
Commissioner Virginia Vigil
Councilor Rebecca Wurzburger
Ms. Consuelo Bokum
Councilor Chris Calvert
Commissioner Liz Stefanics [4:15 arrival]

Member(s) Excused:
None

BDD Board Alternate(s) Present:
Commissioner Danny Mayfield

Staff Present:
Robert Mulvey, Facility Manager
Rick Carpenter, BDD Project Manager
Nancy Long, BDDB Consulting Attorney
Stephanie Lopez, City Staff
Steve Ross, County Attorney
Erika Schwender, BDD Compliance Officer
Brian Snyder, City Water Division Director

3. APPROVAL OF AGENDA

Upon motion by Councilor Wurzburger, seconded by Councilor Calvert the agenda was unanimously approved. [Commissioner Stefanics was not present for this action and Commissioner Mayfield voted in her absence.]

4. APROVAL OF MINUTES: September 1, 2011

Councilor Wurzburger moved approval. Her motion was seconded by Councilor Calvert. The motion passed without opposition. [Commissioner Mayfield abstained and Commissioner Stefanics was not present for this action.]

5. APPROVAL OF CONSENT AGENDA

8. BDD Public Relations Report [removed]
9. **BDD Project Manager's Monthly Project Exception Report**

Councilor Calvert requested that item eight be removed and the consent agenda be approved with that change. Councilor Wurzburger seconded and motion carried by unanimous voice vote. [Commissioner Stefanics was not present for this action and Commissioner Mayfield voted in her absence.]

6. MATTERS FROM STAFF

None were presented.

7. FISCAL SERVICES & AUDIT COMMITTEE REPORT

BDD Project Manager Bob Mulvey said the committee met on October 4th and there were no major changes to the capital plan. A report will be forwarded to the BDD on November 4th.

8. BDD PUBLIC RELATIONS REPORT

Councilor Calvert asked whether information regarding the treatment plant is available in real time. Lynn Komer, BDD Public Relations Contractor, stated the information regarding daily diversion flow has been available for the past two weeks. A new platform has been created for the website that will facilitate additional information. Ms. Komer anticipated that would be operational very soon.

Councilor Calvert moved to approve item 8. His motion was seconded by Councilor Wurzburger and passed by unanimous voice vote. [Commissioner Stefanics was not present for this action and Commissioner Mayfield voted in her absence.]

DISCUSSION & ACTION ITEMS

10. Request for Approval of Amendment No. 1 of the Existing Sole Source Agreement Between the Buckman Direct Diversion Board and hall Environmental Analysis Laboratory (HEAL) to Increase the Contract for the amount of $40,000.00 plus $3,275.00 (NMGRT 8.1875%) for a total of $43,275.00

Erika Schwender, BCC Regulatory Compliance Officer, requested that the Board consider an increase to the existing sole source professional service agreement with HEAL to provide analytical laboratory services for the project. The original contract was in the amount of $35,000 and if approved this will increase the total to $75,000. She attributed the request for additional services to the Las Conchas Fire which required the BDD staff to conduct additional and unforeseen monitoring of the Rio Grande and finished drinking water.

Ms. Schwender confirmed that HEAL was currently under a Sole Source Professional Service Agreement and explained that HEAL is the only accredited local laboratory that can offer the required analytical services with acceptable turn-around times. Furthermore, the BDD has been receiving excellent service and reliable data from HEAL. She said the BDD will benefit from continued services from HEAL due to their knowledge of and experience with BDD related monitoring programs.

Responding to Board questions, Ms. Schwender said HEAL conducts NPDES related tests and the contract extends to the end of this fiscal year. She identified the tests that HEAL provides.

[Commissioner Stefanics arrives at this time.]

In regard to the sole source agreement, Commissioner Mayfield requested that staff prepare an RFP that contains time parameters for testing results and issue it prior to the next fiscal year.

Councilor Calvert moved to approve Amendment No. 1 as outlined in the caption. Councilor Wurzburger seconded and the motion passed by [5-0] voice vote.

INFORMATIONAL ITEMS

11. Presentation of the Integrated Stormwater Monitoring Program Associated with the Las Conchas Fire [*Exhibit 1: BDD Staff report*]

Mr. Mulvey introduced this presentation as an outline for the Board of the related efforts agencies are doing to deal with the runoff from the recent storm events.

Ms. Schwender said the Board requested additional information regarding the stormwater issues. She said the monitoring efforts have been an interagency effort with

NMED, LANL and BDD participating. The Integrated Flood Risk Assessment Team (IFRAT) includes representatives of NMED, LANL, BDD, DoE, the Pueblos and other interested parties is focused on evaluating possible risks associated with the ash resulting from the Las Conchas Fire. They are reviewing and comparing sample results from Las Conchas to data from Cerro Grande to better evaluate health and environmental risks associated with the Las Conchas fire.

Ms. Schwender reviewed the impact of the Las Conchas fire which is the risk of flooding due to increased flow after rainfall, likely increased sediment concentrations in stormwater run-off and possible elevated levels of alkalinity and contaminants including heavy metals and radionuclides in ash, ash laden sediment and ash impacted stormwater run-off. She mentioned the Burned Area Emergency Response (BAER) Team that was established to address immediate threats to life and infrastructure in and around the burned area. The Team was composed of members of USFS, BLM, USGS, ACE, local governmental agencies, LANL, and BDD.

She discussed the expected elevated concentrations of contaminants such as metals, radionuclides, PCBs and other contaminants. She noted an early warning monitoring system has been used and that the collaborative efforts between the governmental agencies make it possible to maximize monitoring coverage efforts.

Stormwater Monitoring from the Perspective of the NMED – DOE Oversight Bureau [*Exhibit 2: NMED Report re: Sampling Efforts*]

Tom Skibitzki, Chief of the NMED DOE Oversight Bureau, said over ten years ago the Oversight Bureau began identifying LANL legacy contaminants in the sediments and the watershed along the Northern Rio Grande in the area of the Buckman Diversion. The highest levels that were noted were in Ancha Canyon which contains the historic Buckman landing where the diversion was planned to be constructed. The Bureau began working with the Buckman design firm, LANL and a number of other agencies to try and identify whether or not the footprint for the direct diversion itself would happen in that area where the high concentration of contaminants were located.

[A verbatim of Mr. Skibitzki's comments are provided as follows:]

These contaminants were contained in sediments in soil that were within an abandoned river channel. So we tried to delineate where those contaminants were and we did. We determined that those concentrations were approximately 500 feet away from where the planned construction was to occur. So, therefore, construction activities would not disturb those contaminated sediments and also workers who were building those diversions would also not come in contact with those contaminants.

The thing that we did find at the location of the diversion itself are the legacy contaminants that are associated with atmospheric fallout. We find them everywhere and they presented no risk beyond what you find in any excavation or in any sediments or soils in the general area.

We determined that the biggest risk was storm flows that were coming out of Los Alamos Canyon. A place where there is a history of contaminants within that particular watershed. Los Alamos Canyon in particular and Pueblo Canyon. Both contained contaminants from Laboratory operation that were sequestered away in the soils as time went by cleaner sediments would be deposited on top of the contaminated sediments and

they in essence got deeper and the surface got higher and the contaminants were sequestered away. Then the Cerro Grande Fire came along in the year 2000 and it severely burned the watershed and as Erika described that caused the storm, the flood intensity to increase dramatically which caused additional erosion and many of these contaminants that were sequestered away in the sediments were now being exposed, remobilized and then moved downstream some of which made their way to the Rio Grande.

So the concern from our perspective became how might these contaminants affect the water quality of the Rio Grande and that is part of what we began looking at in earnest. Los Alamos National Laboratory or LANL and the Oversight Bureau worked pretty hard at establishing a network of stormwater monitoring locations in the watershed. If I were to give a sound bite description of what the water quality in the Rio Grande is today I would say that overall the water quality is good and it's good under what we call base flow conditions. So under normal conditions, just ambient conditions of the water flowing down the river, water quality in the river is pretty good. We don't see a lot of contaminant concerns at concentrations that are going to be problematic for people. The things that we do tend to see are primarily related, when we do see things, we see them in association with wet weather events. When heavy storms or when rain fall causes a lot of storm flow and it mobilizes a lot of sediment. The studies that we've conducted have shown a strong correlation of contaminant concentration to suspended sediment concentration. So the more sediments that are present in the water, the more contaminants that you're likely to find. Many of the contaminants and concerns things like metal, radionuclides, PCBs, things of that sort, have a strong affinity for very fine grade particles and organic matter. So the more sediment you have, the more fine grade sediment you have, the more you're going to see concentrated – well, you'll see elevated concentrations of these contaminants that we're concerned about.

Naturally occurring uranium is also present in the soil and it also is elevated under the storm flow condition. Aluminum concentrations are another thing that we'll see. Aluminum is the most common metallic element in the earth's crust and the Jemez Mountains in particular are rich in it and so when there are storm events in the Jemez Mountain particular downstream of Cochiti Dam, the Rio Grande will show elevated levels of aluminum.

When the Surface Water Quality Bureau looks at the quality of the water now they have – there are several things that they are concerned about. In the stretch of river between Cochiti Dam and Albuquerque they may add to the list of impairments on that stretch of river PCBs and E. coli in the stretch of river north of Cochiti Dam and that which encompasses the reach of the that includes the Buckman Diversion, the largest impediment appears to be turbidity which are the suspended sediments and E. coli. The source of the E. coli has been traced back to wildlife, humans and dogs. So be more than a good neighbor and pick up after your dog.

During this review cycle the Surface Water Quality Bureau is taking a close look at the upper Rio Grande stretch, which encompasses the Buckman Diversion, and, again, E. coli is probably the contaminant of concern. The good news is that water treatment plants, drinking water treatment plants like the one here is Santa Fe and like the one in Albuquerque are especially good at dealing with these types of contaminants. With respect to stormwater monitoring on the Rio Grande itself, we have approximately 10

stormwater monitoring stations. These are automated samplers that respond to changes in river height. We have a station above the Otowi Bridge that's just above the Los Alamos Watershed Rio Grande confluence. This device is programmed to collect samples during regional storm events in the river. There are two stations that the Oversight Bureau has co-located with stations that the Buckman Direct Diversion has at the diversion itself. One of those stations is programmed to collect samples from the river when there is a regional storm event so this is something that is not coming directly out of the Los Alamos Canyon. The other sampler that we have is tied into the early warning system that Buckman uses. The telemetry device will send a signal to the sampler when there are flows occurring in Los Alamos Canyon. When those flows eventually make their way to the Rio Grande, our sampler will collect during that event. This gives us the opportunity to compare water quality in the river when there's an event that occurs in Los Alamos Canyon, when the Los Alamos Canyon is flowing, against water quality in the river when you have a regional event from coming down the Rio Grande.

We have another station located near the Alameda Bridge in Albuquerque just north of where the City of Albuquerque's diversion works are located. We have a station located in Peralta Canyon just above the Tent Rocks monument. Peralta Canyon discharges to the Rio Grande below Cochiti Dam. Cochiti Lake does a great job as a settling basin and so this provides the opportunity to see what impacts might be noticed in the river that did not first go through Cochiti Lake.

We have a station located at Bland Canyon of Forest Service land. Bland Canyon is a location where historic gold mining has occurred in the past and so this will provide – we expect to see different kinds of things coming out of that watershed as well. And then we have a location established in Cochiti Canyon at the Dixon Apple Orchard. In the handout I've provided on page nine you'll see a grainy looking picture and it's grainy because that's the kind of weather day we had that day, and let me just point out a couple different features of what you see. Those nice little green circular objects are the apple trees within the orchard. That big ugly gray thing that goes down the middle is a – bed that happened on August 22nd. This was probably the largest storm flow that we've witnessed in our lifetime. We estimated that that storm flow was approximately 19,000 cubic feet per second. To put that in perspective, that's about 48 times the flow of the Rio Grande at the Alameda Bridge in Albuquerque. I did a quick calculation, if this room is 30 feet wide and 60 feet long, 10 feet high, let's assume that this is about a 1000 square foot room and if that's a 10 foot ceiling we've got 10,000 cubic feet in the space that we're in right now and we saw flows – we estimated flows at over 19,000 so almost two rooms this size, the volume of this room twice per second flowing down. And so in the time that it takes you to go "one Mississippi, two Mississippi, three Mississippi," six volumes of this room have gone by and that flow was just devastating to the orchard and it moved an awful lot of material.

Erika spoke of the IFRAT, the Interagency Flood Risk Assessment Team, and our focus for locating our sampling devices is to maximize our exposure our coverage, minimize the redundancy when there's a number of different agencies collected environmental data and to insure that we have data compatibility and comparability. So we all coordinated what we're going to look for, how we're going to put samples or where we're going to locate our samples and what type of analyses are going to be

performed on those samples. On the back of your packet you'll see a list of samples that were collected only by the Oversight Bureau. There is a – we now have a consolidated list where everyone who has collected samples, Los Alamos, Buckman and ourselves and it's probably, there are probably in excess of 240 samples that were collected and will be analyzed to provide data for this event.

During the rainy season which is hopefully, hopefully is probably he wrong word, but during the rainy season our focus is on collecting, the IFRAT's focus is on collecting stormwater samples. As the seasons change and stormwater becomes less we're going to change our focus and then look more at collecting primary ash samples, soil samples that have been – and then we'll have the opportunity to compare that against each other.

So what are the risks? Well, our assumption is that if we discover or if we measure contaminants at levels that were equal to or less than what we measured following Cerro Grande then we think it is reasonable to assume that the risks will be commensurate with what we've seen there. So that's our starting point and we're using data gathered during the Cerro Grande fire as our baseline to compare data from the Las Conchas fire, again.

The primary advice that came from that with respect to managing risk to people was to not use the ash from the fire as a soil amendment. In many parts of the country people do that. In our part of the country where the soil is very alkaline to begin with, it's not a common practice, however, to minimize any risks that a person might from nutrient uptake by plants and vegetables. The recommendation following Cerro Grande was don't use the ash in your garden. So that is at least the same advice that we're offering now until we learn more. Don't use the ash in your garden; however, exposure to the ash and exposure to sediments containing the ash are not going to cause any acute health effect.

So in conclusion I'd like to mention that the New Mexico Community Foundation is the third-party administrator for something known as the RACER database and RACER has or will eventually have all of the results for all environmental monitoring that was conducted at Los Alamos by the Laboratory, by the Oversight Bureau as we're currently working to get all the Surface Water Quality Bureau's data in that database as well. And so they are – all that data is there. RACER may not be the easiest thing to use right now but it is available. All the data is available to the public and RACER is currently migrating to a new computing environment which will add capability and make the data more accessible and useable to the public. And so that was my five minutes of non-stop talk and I'd be happy to answer any question you may have.

Board member Bokum asked whether the Bureau had adequate resources to conduct the sampling.

MR. SKIBITZKI: Tough question. We are very fortunate in that the Oversight Bureau is 100 percent federally funded and we have adequate resources to conduct all of the necessary work that needs to be done right now. I have to say that probably the bill for analyzing these samples is going to be upward of a quarter of a million dollars, which is a significant amount of money in anybody's budget. But we do have those resources available and we can pay for those tests.

Board member Bokum said she appreciated the comparison of the Cerro Grande fire to the Las Conchas fire but noted the difference in that water was not being diverted during Cerro Grande. She also requested additional information regarding ash.

MR. SKIBITZKI: Correct. A couple of points. Both the Buckman Direct Diversion and the Albuquerque Diversion have the capability to turn off the intake if you will; to not bring water in during times when river conditions are not optimal. And so they do this for a couple of reasons. Number one, the efficiency of the plant is maintained and their costs for treating the water are greatly increased if the water has a very high sediment load. So by not withdrawing water from the river at that time they maintain the efficiency of the plant. They reduce or they keep their cost within manageable limits and there's no risk. The river – and under ambient conditions the quality of the water in the river is quite good. So they've got a couple of things. They can not divert during periods where there's a high sediment load. That will save them some money and improves the efficiency of the plant. But even if there weren't to do that the plants are very good at removing fine sediments and organic matter and those fine sediments and organic matter are – there's a very strong correlation between that sediment and the contaminants that are associated with them. Did I answer your question?

Certain elements are concentrated in ash so plants will take certain contaminants up as nutrients, cesium and strontium, things of that sort might be incorporated into the plant material itself. Other elements, other metals and particularly plutonium and uranium are not picking up very well by plant matter and so essentially it is all being captured there in the plant material. When you burnt the plant it reduces the ash you significantly decrease the volume of material that held these contaminants and so therefore the contaminants that are present in the vegetated material are concentrated in the ash. But the concentration by themselves do not create an acute exposure. So if you were to go out and cover yourself in the dust or eat a mouthful of dust or ash or swim in the river when it was mucky gray you're not going to be experience an acute exposure to the types of metals and contaminants that will be concentrated in the ash. Because they are still at very low levels. They are elevated above what we normally find but they're not elevated to the point where they create an acute exposure.

Councilor Calvert asked for specifics on the location above Alameda on the Rio Grande in Albuquerque.

MR. SKIBITZKI: When I refer to the Rio Grande above Alameda in general I am referring to that stretch or reach between Cochiti Dam and Alameda. I think that paragraph that you're referring to is very specific to where the north diversion channel in Albuquerque discharges into the river. That north diversion channel which is right there on the boundary of Sandia Pueblo and the City, it's just a mile or two above the Alameda Bridge, that diversion carries water from approximately 88 square miles of the City of Albuquerque. So everything that gets washed off of the roads and everything that gets washed down ends up in that north diversion channel for the Northeast Heights and it dumps into the river above Alameda. That was my context for what I think you were referring to.

Chair Vigil asked what other agencies were sampling water and how the agencies communicate.

MR. SKIBITZKI: That depends on what kind of water testing you're referring to but in general the USGS, the US Geological Survey, conducts water sampling of the river. The Environment Department Surface Water Quality Bureau does sampling of the river. Buckman, of course, does. The Albuquerque Bernalillo County Water Utility Authority does. The Corps of Engineers I know conducts sampling in the Cochiti area and there may be others but those are the primary ones that we share information with regularly.

We coordinate with Los Alamos National Laboratory on our sampling regime and own their sampling regime because our mission, the goal of our Bureau is to conduct oversight of DoE activities in the State and so we work very closely with the National Laboratory and we coordinate with them. We know what they're doing. We tell them what we're doing and we share information. So when we gather information we report it to the DoE. We publish it internally and we share the information with anyone who asks for it. So there are various public outreach opportunities some of which – primarily is the website and so when we get results back we share the results and we discuss the results. We look at what they have and they look at what we have and we talk about it.

Stormwater Monitoring from the Perspective of LANL.
[*Exhibit 3: LANL Integrated Post-Las Conchas Monitoring Report*]

STEVE VEENIS (LANL): Madam Chair, Buckman Board, my name is Steve Veenis. I am a project manager up at Los Alamos for surface water and canyon sediment investigation. One of my foremost responsibilities is stormwater monitoring in Los Alamos. I'd like to get into a little bit of what we've been doing post Las Conchas fire. As Tom suggested we are working in coordination with each other, local organizations, that have been collecting a great amount of data more or less since late July. It started raining the last couple of days of July so ourselves along with NMED, the Buckman folks and the Albuquerque Water Utility have been collecting a fair amount of information since the fire. The intent of that is to form an integrated approach to assessing the impacts of the fire based on the data that was collected. And the data collection methodologies, like Tom suggested we talk a lot together. We try to collect the samples in the same manner. We use automated samplers and you've probably seen some of those around. They automatically collect samples based on the detection of flow but we also collect manual grab samples as needed. The objective really is to collect as many samples as we can when storm events occur that generate runoff. Now as you might guess, after a fire such as Las Conchas, sample collection is not as easy to perform, as it would be under a normal circumstance. So the technology is really pretty good for most stormwater sample collections that have been developed over the years but whenever a fire occurs the ash really does a trick on the sampling technology. They're not nearly as efficient in collecting the samples but we have had quite a bit of success since late July. The reason that we want to try and collect samples the same way is so the data will stay comparable. So when we get comparable datasets the data can be

combined together to perform the risk assessments and other things that we do with the data.

The coverage of the sample collection, and some of this might be redundant with what Erika said and what Tom said, but from LANL we have supported the collection of data both upstream and downstream of Laboratory boundaries and so those familiar with Los Alamos know that the Jemez Mountains are right above the town site so we collect the samples from four gauge stations right above the lab property and we also collect samples from throughout the laboratory but the downstream boundary stations are the ones that I think most people are probably most concerned with. We currently have 17 gauges and we have a larger network but 17 of the gauges are supporting the burn area monitoring. We also work with the Buckman folks on their monitoring of the Rio Grande and then in addition we are collecting samples of both in Frijoles Canyon out near Bandelier and in Guaje Canyon which is north of the property between us and Santa Clara. And, so, we have had some success collecting samples and I'll get into what we found in a second. Data types reflecting storm water samples were collected and we will be collecting a lot of sediment samples and ash samples this fall once the Monsoon season starts we're going to go back and look and see where the deposits occurred and sample that material and continue the support with the Rio Grande samples. If you can see this picture – the one thing I wanted to point out is that this particular picture is one of the gauge stations at San Ildefonso property, 109.9, and this is a station that we installed as part of the early notification system.

The goal of the integrated monitoring effort really is to develop a dataset of comparable data that the agencies can use to support this future risk assessment that will be performed by the Interagency Flood Risk Assessment Team or IFRAT. IFRAT was a team player in the post Cerro Grande risk assessment so it seemed like this would be a good mechanism to perform a similar function after this fire.

LANL's goals are really to just try and support identifying and evaluating any contribution that LANL might have and contamination that might be observed in the stormwater leaving the lab and making its way down towards the Rio Grande. A follow up to that would be for us to take actions necessary to mitigate any of the risk that might be observed and repair damage from the post-fire flood. And so I think many of you have probably heard some of the post-fire mitigation effort that we conducted right after the fire. Things like removing sediment from the weirs and the sediment pond on the Lab property and moving the waste out of the canyon so they wouldn't be accessible to flows, protecting the groundwater monitoring wells that are in the canyon and then one thing that you may or may not have heard is that recently we helped support a new flood alert system in the upper watershed of the Jemez above Los Alamos. This is really used to support worker safety so a lot of people out at the canyon are working these efforts so when it starts raining hard and the watershed is used as a mechanism to get them out of the field in a safe manner.

As far as repairs the only real repair that we have scheduled to date are some damage to some of the gate stations that are located internal to the lab and I'll show you a little bit of that. This is another map that shows the burn severity of Las Conchas and so the red areas are the highest burn activities and you can se it is kind of scattered across the watershed and it's got an on and off as to whether it was a high severity burn but it did burn a lot of acres as everybody knows. And if you look at the map, it's kind of hard

to see I know, but on the last boundary – the pink area, see where it turns a darker maroon squares, those are the gate stations. The four most western squares are the ones that monitor the – [speaking away from microphone] The interior gauges that got damaged are in the green squares that are central to the area, I guess left of that but we had five gauges that were damaged during the August 21st and 22nd storm event. That was a big flood event that pretty severely damaged those gauges and we're working at getting those repaired but the upstream boundary station and the downstream boundary stations are all functional and operating.

So the 18 gauges that are supporting the post-fire monitoring efforts all have a monitoring plan – and you can't see this picture very well but in the upper right hand corner that's the monitoring plan and an enhanced perimeter plan that we added more constituents to than what we already had to support the fire.

Since the fire we've had 21 separate days where we have observed runoff and we've been able to collect a little over 50 samples to date. So those 50 samples have been collected throughout those 17 gauges. The location upstream of the lab operations are the ones on the western boundary and the canyons immediate north and south of LANL which would be Guaje and Frijoles Canyons which would represent an unaffected lab operation location have all successfully collected samples and basically what this does is helped us characterize constituents that are found in ash and largely mountain soils underneath. That's one of the key ingredients of what is being sampled of these post fire events. Downstream from LANL boundary location we were monitoring both above and below Buckman and so the gauge stations that are located in the first picture that I showed you and some of you actually had tours and you saw is the one that would discharge – the only one that would discharge above Buckman and go to the river. So anything that comes down Los Alamos and Pueblo Canyon would eventually funnel through that very gauge one of several that we're monitoring among several that we're monitoring the runoff right above the river also the early notification system. So to date at just that location we've got 27 samples in Los Alamos Canyon and of those we've collected nine samples at that very gauge that we looked at. But the good news is that of those nine we've collected and of all of the flow events that have occurred at that location only two came directly from the lab. Mostly all of the run-off events that we've seen to date are largely coming from Santa Clara and Guaje Canyon. Guaje Canyon enters into the watershed from the drainage right above E109.9. The gauges that support sample collection in Pajarito and Water Canyon. We've collected several samples there as well. They would discharge below Buckman onto the Rio Grande but we've only had one event at each of those canyons that made it all the way to the river.

I think that's overall pretty good news. That basically shows that the run-off is not usually making it through lab property down to the river.

Constituents that we're observing at the location that are unaffected by LANL are pretty much consistent with what we saw after Cerro Grande. It burned some of the same locations that Cerro Grande burned. It basically burned everything that Cerro Grande didn't burn. But we're seeing the same kind of things and those as Tom was suggesting in the sampling that they did are exceeding some of the State Water Quality standards for things like cyanide, dioxins and furans. The sources from those constituents is usually from combustion of organic materials in burn areas. We're seeing metals but the metal that we're basically seeing that are exceeding any standards are things like selenium and

manganese. And then for the radionuclides and PCBs we're seeing those in what's coming on to the lab and what's leaving the lab, but it appears that the concentrations are lower at what's leaving the lab than what's coming onto the lab. I think a lot of people might be surprised by that. With the small data set that we have received the data back from to date that seems to be the story for now.

For observations at lower lab boundary locations including 109.9 we are seeing some of the same cyanide and PCBs but like I mentioned earlier these are mostly samples from the Guaje watershed and not coming from lab property. We're also seeing metals, radionuclides, and dioxins/furans at similar concentrations above LANL. So as these data are received, the way that the process is set up, we collect the samples and we submit them to an offsite lab. The data comes back to us electronically. That data is validated and then it automatically pushed over to RACER. So this information as it comes in goes straight to RACER for public review.

We have put in a request to outside lab for expedited turnaround time for all [inaudible] fire-impacted samples. So we're getting those back as soon as they can get them to us. And, finally the data, as we said before, is being integrated with NMED, BDD, and the City of Albuquerque to support this IFRAT risk assessment. We don't have a date on when they're going to do that but I was told that they were shooting for some time next spring. So we'll be collecting that data all the way up through probably usually in November. It takes a couple of months to get the data back and validate it and into the system and – then we'll all go to work and I'll be happy to answer any questions that I can.

Responding to a question posed by a Board member, Mr. Veenis said LANL uses an outside-accredited lab in South Carolina called GEL, General Environmental Laboratories. The turnaround time is normally 30 to 60 days and expedited jobs are anywhere from three to five weeks. The results are posted in RACER and various other reports are provided.

Mr. Veenis mentioned that Pueblo Canyon has not discharged – not one time. He did not know if that fact was attributable to the work done in the canyon or the intensity and location of the storm.

Stormwater Monitoring from the Perspective of the BDD

[*Exhibit 4: BDD staff report re: Post-Las Conchas*]

MS. SCHWENDER: During the monitoring program it also involves the monitoring of the finished drinking water and I will comment on what the results will be.

I will be the next presenter. Thank you for your time, Madam Chair. I would like to briefly summarize recurring stormwater and water quality monitoring efforts of the Buckman Direct Diversion project. The BDD is taking the protection of the public health very serious. Although we are confident that the already established stormwater monitoring program effectively protecting Santa Fe's drinking water from LANL's contaminants, we heightened our efforts by increasing the sampling frequency and the number of analytic parameter per sampling event. The BDD collects finished drinking water samples as well as Rio Grande samples during storm events when the LANL early notification system is activated as well as during non-LANL ash events and during non-

LANL non-ash events. This basically means any storm event that is coming through the area where the Buckman Direct Diversion structure is located we are collecting samples and have various parameter schedules that we're then identifying to the different storm events and then sending them out to independent laboratories. The samples are tested for hundreds of parameters including those set out by the Safe Drinking Water Act. To protect the BDD from taking in river water that may have been impacted by LA Canyon run-off, the BDD has implemented an extensive early notification system together with LANL. Three gauging stations have been located and implemented as LA Canyon. The locations offer useful [inaudible] for E50 at LA Canyon before the Pueblo Canyon confluent. Another gauging station is located at Pueblo Canyon before the LA Canyon confluent and the most important gauging station is at LA Canyon about half a mile up canyon before the Rio Grande confluent. That station is called E109.9 and you probably hear a lot of reference to that station. That is the station where we receive signals when flow comes through LA Canyon before it hits Rio Grande River. The ENS will be triggered at any of these stations with flows greater than 5 cfs. If station E109.9 is triggered the BDD diversion will automatically shutdown and at the same time all of the samplers are activated to collect samples from the river. The BDD's strict shutdown policy calls for all diversions to cease when the river water has turbidity greater than 300 ntu. Turbidity expresses the cloudiness of the water and it can indicate how much sediment may be flowing in that water. Volatile organic compounds if they are greater than 2 part per million we also cease diverting water from the river and at any time that we receive a trigger E109.9 we would cease diversion.

I would like to emphasize our professional approach to sample collection, analysis and data validation. The BDD follows sample protocols established by the US Environmental Protection Agency. Our samples are collected by experienced and certified water sampling technicians. All samples are sent to independent and certified laboratories. These samples are then analyzed for hundreds of parameters including metal volatile organic compounds, radionuclides, PCBs, cyanides, and many other parameters. Once the analytical data has been received from the independent laboratory it is carefully reviewed to assure the laboratory followed standard quality control procedures, that the data is reliable and accurate, and that the analytical method is compatible so that data can be compared from data from previous sampling events.

As you can see on the slide, data and monitoring information is posted on various websites and made available to the public. I also would make a brief comment on how we are handling the early notification system sampling. Samples are collected when the early notification system triggers at E109.9, it triggers the auto-sampler down at the river which is just slightly up river from the intake of the Buckman Direct Diversion. The BDD collects the samples from these auto samplers the very next day which the BDD also prepares the samples for shipment. The samples are then sent to an independent laboratory and we are sure that those laboratories are certified. The BDD will receive lab reports from the laboratory and when the laboratory report comes from the laboratory it is sent to the BDD as well as to LANL. And LANL then sends the report out to a third-party reviewer. The third-party reviewer reviews the data for quality assurance items and insures that the data produced by the laboratory can be relied on as accurate. Once the report is received by the BDD from the third-party reviewer, the BDD will, again, review that report and then post the data on RACER. So our stormwater monitoring data from

the early notification system will be posted on RACER as well. And, we are assuring that it is all coming verified from laboratory to us and we are preparing samples – that there's no conflict of interest essentially.

This table summarizes our stormwater and finished drinking water samples collected by the BDD since July 15th. July 15th was the first post-Las Conchas fire storm event passing by the BDD intake structure. The BDD decided to stop diverting water from the Rio Grande between July 15th and August 17th to further evaluate possible impacts of the ash laden stormwater on the treatment process and on operational cost. To date we collected two finished drinking water samplers, five non-LANL ash storm events, eight non-LANL non-ash storm events and eleven LANL early notification system storm events. Most of those ENS storm events originated in Guaje Canyon which is not associated with legacy contamination from LANL. All of the storm events samples are collected from the river at the BDD diversion cluster.

I would like to emphasize that the BDD drinking water is and always has been safe to drink and meets all Safe Drinking Water Standards. Madam Chair, members of the Board, let me underline that based on the current water quality and compliance and testing of our BDD finished drinking water it is fully compliant with the Safe Drinking Water Act. As you can see on this slide, for example, test results for gross alpha concentrations of the finished drinking water range from undetectable to 3 pu/per liter. The federal standard is 15 pu/per liter for gross alpha. Our parameters for metals as well as for the organic and inorganic compounds were well below the Safe Drinking Water Standards.

With respect to stormwater we did confirm that the Rio Grande may potentially carry elevated concentrations of contaminants during the storm event. Again, that is data and confirmation of pervious data that the stormwater may carry elevated concentrations. I would like to point out, however, that the BDD has not and will not divert water from the Rio Grande during storm events which would prevent increased levels of contaminant from entering the water treatment system as well as solids with increased contaminant concentrations from being accumulated in the water treatment plant. Reviewing analytical data from the storm events showed that unfiltered stormwaters contains increased levels of silt contaminants but by merely filtering the samples these levels were decreased to below safe drinking water levels. The increase aluminum concentrations observed in this unfiltered stormwater sample is, like it was pointed out earlier by Tom, a small – attributed to [inaudible] but aluminum is naturally occurring in the Jemez Mountain and again if you look at the results the aluminum concentrations of the filtered stormwater samples were well below drinking water standard limits. Summarily, gross alpha and gross beta levels in stormwater were elevated while the filtered sample concentrations were below the Safe Drinking Water Standards.

The BDD is committed to protecting the public health and transparency. Data monitoring information is made available to the public on websites by the BDD, RACER, the NMED Surface Water Quality Bureau, and the NMED Bureau Oversight Bureau. BDD data will also be posted on RACER as I mentioned earlier.

Madam Chair, members of the Board I would like to emphasize the following: The BDD drinking water meets all the Safe Drinking Water Standards and is safe to drink. The BDD has implemented the very conservative policy about when to cease Rio Grande diversion. The BDD will also continue its extended stormwater, raw water and

finished drinking water monitoring. The BDD is committed to transparency and data sharing to protect the public health and consumer confidence.

Madam Chair, members of the Board, I would like to thank you for your time and attention. As I mentioned earlier, we are now ready to answer any questions if you have any.

Commissioner Stefanics thanked the presenters. Commissioner Stefanics posed a scenario in that that the State and DoE Oversight Bureau found a problem in the water and asked how they would interface with BDD or City/County government.

MR. SKIBITZKI: Madam Chair, Commissioner Stefanics, we share data regularly. If, for example, preliminary results suggest that there is something that is outside of expected parameters than the first thing that we do is to check and make sure that that truly is what the laboratory, the analytical laboratory is reporting. The next thing that we do is we get on the phone and we call the different entities involved. We talk with the folks at the diversion. We talk with the folks at LANL. We talk with the folks at Albuquerque. So if we find something that stands out for whatever reason the first thing we do is we share the information among ourselves to discuss it. We might have had the opportunity to have collected – to see the same results. If we all collected samples at that particular time and location or just by collaborating on what the results might mean is a very useful exercise for us.

Commissioner Stefanics said she was asking whether the State would say, "the test results are such that you must stop providing water from the BDD." She said she was seeking to understand the role of the State's DoE Bureau in the monitoring program.

MR. SKIBITZKI: Do I understand you to be asking would we, would the Environment Department make a recommendation to turn off the taps and don't draw water from the river? There are many ways to qualify that but let me give you the most direct answer that I can. Our role is to conduct oversight of DoE facilities and if in the process of doing that we discover something or learn something or become aware of something that has the potential to impact in someway either the public health or the environment then it is incumbent upon us to get that word out and share it.

We are not decision makers. We provide the information to the decision makers so that they can make an important decision.

MR. MULVEY: Madam Chair, the BDD is primarily regulated by the State Drinking Water Act. Our standards are set by that. I think that the present agents tonight highlight the importance we place on collaborations. We rely on interagency collaboration. We are committed to transparency.

Commissioner Mayfield asked whether Buckman staff monitored nearby wells.

MS. SCHWENDER: The city of Santa Fe has a monitoring program for the Buckman wells and actually the State of New Mexico Environment Department Drinking Water Bureau collects regularly samples for any water drinking monitoring – so we compare our drinking water with other drinking water sources and vice versa. And

we have actually seen many times that we have, for example, lower arsenic levels in our Buckman Direct Diversion drinking water than what are natural occurring in some other water sources.

Commissioner Mayfield asked whether BDD had a well or test well in the area.

MS. SCHWENDER: No, we do not have a test well because testing wells are usually utilized to see if the groundwater is contaminated but our water is surface water so a well would not be very applicable.

Commissioner Mayfield asked about the closest well to the BDD and Brian Snyder, City Water Division Director, said it was less a mile.

PUBLIC COMMENTS

Having been advised that another meeting was scheduled in the Council Chambers at 6 p.m., Chair Vigil apologized to the public and requested they keep their comments concise.

WILIAM MOULTON: Madam Chair, members of the Committee, we have been hearing this presentation about the stormwater testing but what Tom, and I don't know what your last name is, but what Tom indicated and it's true, the Cochiti Dam and the Cochiti Lake is the de facto containment of last resort for what happens in Los Alamos. I don't under – I understand that there's many tests of stormwater but all of the sediments ends up right there in Cochiti Lake. I don't understand how come the sediment of Cochiti Lake is not been examined as a sample of what actually happens over time in Los Alamos. Also, the biological life that should be there in the Cochiti Lake. Will bio-accumulate and bio-concentrate the contaminants that comes with the ash?

I appreciate the many samples but I think really what needs to be tested is the sediment and the biological life of Cochiti Lake and Cochiti Dam.

MICHELLE DURAN: My name is Michelle Duran and I'm from Smart Life Link and also as a member of Occupy Santa Fe. Thank you, Madam Chair and the Board, this is my first time to speak at anything like this so excuse me if I'm not following any rules.

I have to say as a fairly new resident of Santa Fe I am greatly concerned about Los Alamos and about the water that we're drinking. When I hear that test results come in 30 or 60 days after they've been tested, I wonder what would really happen if something very serious came in those results. Would we all be notified that for 30 or 60 days we were drinking water that was damaging to us? I don't have a lot of faith if that is what would happen.

I am also very concerned that there is that timeline of 30 or 60 days and I also heard that there has been only 50 samples taken in the last two months. If we have a community organized group of water samplers, we would be there daily testing in the water. We're not talking about some kind of food we can choose to eat or not to eat. This is water that we're drinking and bathing in and watering our vegetables with.

I think that there's so many questions around this issue and to bring them up in three or four minutes and not be able to have a real question and answer is a real disservice to us citizens of Santa Fe and I don't know if a town hall meeting can be convened or whatever type of meeting should be convened so that the public really has an opportunity to come and for a few hours really ask questions and get answers that we think are meaningful.

I'm feeling that there's a lot of collection and monitoring and you even have data which is all great, but what's in our water that we're drinking today? One of tests says that cyanide and PCB concentration still exceeds standards and federal standards and radionuclides and dioxides have similar concentrations. We all know those are dangerous and can cause health problems.

Ms. Duran expressed concern of the problems when the facility is not shut down. She said she didn't get the sense that we recognize the magnitude of what PCBs and dioxides can do to "our health and the health of community and children and animals and plants."

Ms. Duran asked about the gauges that have been down in Los Alamos for over six weeks. She questioned the Lab's competency highlighting the fact that they can't even fix a gauge. She repeated her request for a town hall meeting.

Elana Sue St. Pierre, Healthy Water Now, said she had a great deal of concern about the water quality that children and pregnant women are drinking. As an occupational therapist, Ms. St. Pierre said she saw five children after the Cerro Grande with holes in their heart. She expressed tremendous concern that this incident would be repeated. She asked that her questions be addressed and heard by Peter Wirth and Ben Ray Lujan.

Ms. St. Pierre mentioned the 13,000 metric tons of plutonium that is to be stored above the watershed. The experts today failed to mention snowmelt and the toxins that could be going under the radar. She noted that she began attending these meetings because of the plutonium and heavy metals stored 500 yards from the river.

Concluding her comments, Ms. St. Pierre urged the Board to hold a town hall meeting.

Joni Arends, Concerned Citizens for Nuclear Safety, thanked the Board and staff for including the flows on the website. She said the handouts were not posted when she checked the website this afternoon and suggested placing the data on the city calendar. She invited the Board to tour Los Alamos Canyon with CCNS to see what could be coming downstream.

Ms. Arends said she was "livid" that LANL has not repaired six monitors. LANL has a budget of over $2.2 billion and has not made the effort to fix something as essential to protect the drinking water of many communities. She requested LANL formally respond to this issue and that response be posted on Buckman website.

Ms. Arends noted a date related issue with the monitoring and asked that staff review the dates of sampling. There exist many unresolved issues from the risk assessment. She renewed the request for community-based sampling and a town hall meeting.

Ms. Arends confirmed for Commissioner Mayfield that downstream from the diversion site there is Buckman Well #1 where plutonium was found and reported in the annual 2006-2007 report. Buckman Well #8 is to the south and also on the hill.

Sasha Pyle indicated she had 25 years of experience working with non-profit organizations locally, regionally and nationally on environmental consequences of nuclear weapons manufacturing and waste disposal. She said she has worked with CCNS and the national coalition Alliance for Nuclear Accountability.

Ms. Pyle said the risk to the community is the ongoing, chronic risk that comes from decades of exposure from eating local produce, drinking and bathing in the water as well as the potential risk to breastfed children.

Ms. Pyle pointed out that BDD's third-party independent peer review firm, ChemRisk, has multi-million dollar contracts with LANL, corporate polluters and defense agencies. She urged the Board to improve its samplings.

Becky Miller, CCNS, said there are 212 toxic sites on LANL property. She requested that those 212 sites be identified and included in the sampling system.

EXECUTIVE SESSION

Review and Consideration of Issues Relating to the Acquisition of Real Property Pursuant to NMSA 1978, Section 10-15-1-H(8)

In light of the late hour, Chair Vigil requested a motion to table this item until the next BDD meeting. Commissioner Stefanics so moved. Chair Vigil seconded and the motion passed by unanimous voice vote.

MATTERS FROM THE BOARD

None were presented.

NEXT MEETING: Thursday, November 3, 2011 @4:00 P.M.

ADJOURN

Having completed the agenda, this meeting was declared adjourned at approximately 6:00 p.m.

Approved by:

Virginia Vigil, Chair

Respectfully submitted:

Karen Farrell, Wordswork

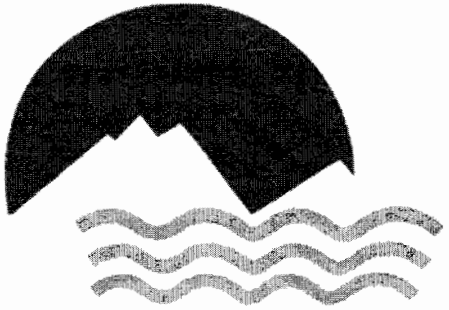
ATTEST TO:

VALERIE ESPINOZA
SANTA FE COUNTY CLERK

ATTEST TO:

YOLANDA VIGIL
SANTA FE CITY CLERK

Integrated Stormwater Monitoring associated with the 2011 Las Conchas Fire



Buckman Direct Diversion Project

Stormwater Monitoring Program Summaries from the perspective of three organizatons:

NMED – DOE Oversight Bureau

Los Alamos National Laboratory

Buckman Direct Diversion Project

Impact of the Las Conchas Fire July 2011

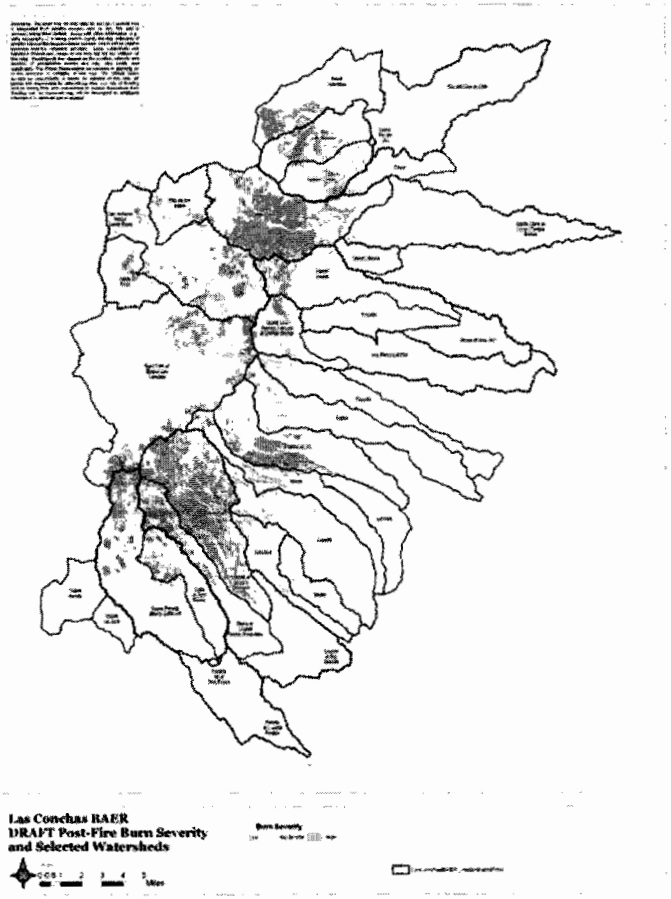
- Risk of flooding due to increased flow after rainfall
- Likely increased sediment concentrations in stormwater run-off
- Potentially high ash concentrations in stormwater run-off
- Possibly elevated levels of alkalinity and contaminants, including heavy metals and radionuclides, in ash, ash laden sediment, and ash impacted stormwater run-off

Interagency Efforts

Various interagency committees were created during and after the July 2011 Las Conchas Fire:

1. **B**urned **A**rea **E**mergency **R**esponse (BAER) Team:

- Was composed of members of the USFS, BLM, USGS, ACE, local governmental agencies, LANL, BDD, etc.
- Addressed immediate threats to life and infrastructure in and around the burned areas
- Established Burn Severity Maps
- Estimated run-off values for watersheds affected by the fire
- Information available at the following websites:
  - http://www.inciweb.org
  - http://nmfireinfo.wordpress.com/



Interagency Efforts

Various interagency committees were created during and after the July 2011 Las Conchas Fire:

2. Rain Notification System Committee

- Consists of representatives of NMED, Pueblos, USFS, BLM, USGS, BDD, LANL, etc.
- Focused on establishing additional rain gages and Early Warning Systems associated with flooding due to rainfall in the burn area

Sub Watershed Name	Burn Severity				Grand Total	High/Mod	% High/Mod
	High	Moderate	Low	Unburned			
Guaje at Hwy 502	930	1080	1260	1020	7270	2020	28
Los Alamos at Rio	1430	2520	2830	1450	11200	3940	35
Santa Clara at Lower Pueblo Bridge	4310	6880	2330	640	14540	11190	77

Interagency Efforts

Various interagency committees were created during and after the July 2011 Las Conchas Fire:

3. **I**ntegrated **F**lood **R**isk **A**ssessment **T**eam (IFRAT):

- Includes representatives of NMED, LANL, BDD, Dept. of Health, Pueblos, etc.
- Focuses on evaluating possible risks associated with the ash resulting from the Las Conchas Fire
- Reviews and compares sample results from Las Conchas Fire to data from Cerro Grande Fire to better evaluate health and environmental risks associated with the Las Conchas Fire

Post Las Conchas Stormwater Monitoring Efforts

- Many agencies, municipalities, and organizations have developed and implemented stormwater monitoring programs to evaluate the impact of the Las Conchas Fire
- To maximize stormwater monitoring coverage and minimize duplication of efforts agencies and municipalities coordinated efforts

Post Las Conchas Stormwater Monitoring Efforts

The following presentations will provide you with stormwater monitoring program summaries from the perspective of the

- NMED – DOE Oversight Bureau, Tom Skibitski
- Los Alamos National Laboratory, Steve Veenis
- Buckman Direct Diversion Project, Erika Schwender

Sample Collection and Analytical Data

- All agencies follow established federal protocols for sample collection established by the US Environmental Protection Agency
- Samples are collected by experienced scientists
- Samples are analyzed by accredited and certified independent Laboratories
- Samples are analyzed for hundreds of parameters including metals, volatile organic compounds, and radionuclides
- Analytical data is carefully reviewed and validated
- Monitoring Data and information is made available to the public at:
  - www.racerdat.org
  - www.bddproject.org
  - www.nmenv.state.nm.us/swqb/MAS
  - www.nmenv.state.nm.us/doe_oversight/pubs.htm

History

Over ten years ago, the New Mexico Environment Department (NMED), Department of Energy (DOE) Oversight Bureau began identifying Los Alamos National Laboratory (LANL) legacy contaminants along the Rio Grande in northern New Mexico. A report released in April 2007[1] described the various levels of legacy contaminants along the Rio Grande including an area at Ancha Canyon – a location that also contains a historical area known as the Buckman Landing and the site for a water diversion (Buckman Direct Diversion, BDD) that will supply much of the drinking water to the city of Santa Fe and neighboring communities.

Once the observation was made that contaminants coming from the National Laboratory had the potential to impact the new water supply the Bureau began working closely with city, county, federal, other state agencies, and interested citizen groups to identify those potential impacts to this resource.

The Bureau completed a project delineating the area containing legacy contaminants at Ancha Canyon and shared that knowledge with the BDD Board, the National Forest Service, the NMED Hazardous Waste Bureau, LANL, and others. The report from this study[2], released in 2008, shows background or non-detectable levels of contaminants in sediment in the proposed construction area of Buckman Direct Diversion Project (BDD). The Bureau found the nearest contaminants are buried within an abandoned river channel 500 feet north of the BDD infrastructure and that construction activities and planned operations of the diversion would not disturb the contaminants.

The source of background contaminants at the diversion site originate from fallout related to atmospheric testing of nuclear weapons that occurred from 1945 into the 1980s.

Legacy contaminants originate from operations at the lab between the 1940s and 1960s when LANL discharged radioactive liquid wastes into watersheds that drained into the Rio Grande. Periodic floods during the 1950s and 1960s from the Los Alamos watershed transported some of those contaminants to the Rio Grande. Those contaminants were subsequently deposited within the abandoned river channel.

[1] "Distribution of Radionuclides in Northern Rio Grande Fluvial Deposits near LANL," Englert, D., Dale, M., Granzow, K., Mayer, R., 2007. http://www.nmenv.state.nm.us/doe_oversight/pubs.htm

[2] "Los Alamos National Laboratory Legacy Contaminant Study at the Buckman Direct Diversion," Englert, D., Dale, M., Ford-Schmid, R., Granzow, K., 2008. http://www.nmenv.state.nm.us/doe_oversight/pubs.htm

Since then and until the Cerro Grande Fire, the frequency of flooding from canyons at LANL diminished and clean sediments along the Rio Grande have covered the contaminants within the abandoned channel.

The most serious impacts that might affect the diversion come from occasional stormwater events flowing into the Rio Grande from Los Alamos Canyon three miles upstream. This watershed is also the source of the existing LANL derived contaminants in the Rio Grande. Treated and untreated wastewaters discharged into canyons at LANL until 1986 include radioactive materials, heavy metals, solvents, and other wastes associated with their research activities.

During the early years at the Laboratory these wastes were carried downstream into the Rio Grande by regular flooding in the canyons on the Pajarito Plateau. By the 1970's the flood frequencies and magnitudes diminished and the remaining contaminants were stored in sediments in and along the normally dry stream channels that run through the Laboratory.

Since the Cerro Grande fire in 2000, canyon floods have increased in intensity and frequency and are eroding the emplaced sediments, exposing and carrying legacy contaminants to the Rio Grande at rates not seen since the discharges of the wastes in the 1950's and 1960's. Although the state does not have authority to regulate special materials derived from nuclear research at the Laboratory, a number of other constituents like PCB's in stormwater leaving the Laboratory property can be regulated.

The Bureau has investigated (Cerro Grande) fire related impacts on the environment[3] around the Laboratory. The Bureau initiated investigations that include measurements of radionuclides and other contaminants in air, northern New Mexico farm soils and produce, forest floor ash, and ash-laden sediments in canyons within the Laboratory facility and in the Rio Grande valley from above LANL down to Albuquerque, and studied impacts to stream channels below burned watersheds. Most importantly, the Bureau also established a stormwater monitoring network within the Los Alamos watershed, and

[3] "Post Cerro Grande Fire Stormwater Transport of Plutonium$^{239/240}$ in Suspended Sediments from Pueblo Canyon, Los Alamos County, NM," Ford-Schmid, R., Englert, D. 2007.

"Post Cerro Grande Fire Channel Morphology in Lower Pueblo Canyon, Reach P-4 West and Storm Water Transport of Plutonium$^{239/240}$ in Suspended Sediments," Englert, D., Ford-Schmid, R., Bransford, K., 2004.

"Post Cerro Grande Fire Channel Morphology in Lower Pueblo Canyon, Reach P-4 East," Ford-Schmid, R., Englert, D. 2004. http://www.nmenv.state.nm.us/doe_oversight/pubs.htm

continues to observe re-mobilization of contaminants on and off Laboratory property, some of which ends up in the Rio Grande.

The department continues to work with LANL, the City of Santa Fe, Buckman Direct Diversion (BDD) Board and staff, and local communities to investigate and implement efforts to reduce the flow of contaminants transported with stormwater from the Lab. In addition, the department is working with those agencies to increase surface water monitoring efforts.

Several entities conduct sampling and analyses at various points along the river and in tributaries from the watershed. The environmental samples (water, sediments, ash, soil, and biota including fish tissue) are collected by staff from the New Mexico Environment Department (NMED), Los Alamos National Laboratory (LANL), contractors to the U.S. Army Corps of Engineers, U.S. Geological Survey, and other entities. The samples are analyzed by independent commercial analytical laboratories and the data appear in published studies and reports. Results are available to the public after they are reviewed and validated.

New data is continually added to the existing body of work and expands the understanding of river water quality and environmental response to various inputs. Please refer to the NMED websites including the DOE Oversight Bureau (www.nmenv.state.nm.us/doe_oversight/pubs.htm) and the Surface Water Quality Bureau (www.nmenv.state.nm.us/swqb/MAS/) to view technical reports, studies, water quality results, and fish consumption advisories.

A project administered by the New Mexico Community Foundation called RACER (www.racerdat.com) is a public access database containing results for nearly all environmental sampling that has been and continues to be conducted in the vicinity of LANL by both the National Laboratory and the NMED Oversight Bureau. This database is updated with new content weekly and will soon feature new tools to make it a more useful resource.

Water Quality

A sound-bite summary of Upper/Middle Rio Grande water quality under base flow ("normal" or ambient) conditions is that it is good overall, with few and occasional minor exceedances of individual water quality standards. Sediments carried in storm flow conditions generally exhibit concentrations that are elevated above ambient levels for

some of the constituents about which people are concerned. These storm flow events are short lived, transient, and their sediment loads fluctuate proportionately with changing flow. When the Buckman Direct Diversion or the Albuquerque Bernalillo County Water Utility Authority (ABCWUA) drinking water treatment plants close their intakes during storm flow events they do so to maintain the efficiency of the treatment process and avoid excess costs associated with removing heavy sediment loads.

Studies conducted by the Oversight Bureau (see "publications" on our website) show a strong correlation between certain contaminants (radionuclides, PCBs) and sediment concentrations[4]. That is, many of the contaminants of concern and other chemical compounds have a strong affinity for and are bound to the fine particles and organic matter in sediments.

As a matter of perspective, it should be noted that Los Alamos National Laboratory is not the only upstream contributor of contaminants found in river water. Metals, contaminants, and other compounds of modern industrial life are all found in surface waters.

Naturally occurring uranium is present in the sediments and is elevated under storm flow conditions. High pH caused by the ash of the recent Las Conchas fire will cause uranium concentrations to be elevated even more. Aluminum concentrations above water quality standards are also routinely observed in the Middle Rio Grande. Aluminum concentrations are known to be high in waters originating in the Jemez Mountains north of Albuquerque[5]. As such, the Jemez River and Rio Puerco, which drains this region, are two potential sources of elevated aluminum to the Rio Grande.

The Rio Grande from Cochiti to San Ildefonso is presently "listed" for turbidity and for PCB in fish tissue. Data collected in 2009 by SWQB exceed *E. coli* standards indicating that this impairment may be added in the 2012 (303d) list. Data collected from the Rio Grande do not indicate impairment for PCB in the water column at this time. The drainages out of the Laboratory property are all listed for PCB so the presence of a source make it possible that the main stem of the Rio Grande would show impairment when these canyons are running hard and the main bed load of sediment is suspended.

[4] "Los Alamos Canyon Watershed Stormwater Monitoring from 2003 through 2008: Contaminant Transport Assessment," Englert, D., Ford-Schmid, R., 2011. http://www.nmenv.state.nm.us/doe_oversight/pubs.htm

[5] "Middle Rio Grande Baseline Water Quality Survey – Final Report," Stringer, S., Davis, A., 2009. http://www.nmenv.state.nm.us/swqb/MAS/

The Rio Grande from Cochiti to Albuquerque is listed for PCB in fish tissue and *E. coli* in water south of the 550 bridge. The three top contributors of the *E. coli* in the middle Rio Grande are birds, dogs, and humans. Data collected by the DOE-OB from near the confluence of the north diversion channel and the Rio Grande in Albuquerque exceed standards for PCBs and indicating that this impairment may be added in the 2012 (303d) list. Low dissolved oxygen (DO) is measured in the river following storm events at this location when the north diversion channel is discharging. Storm flows here appear to push out a slug of water with no measurable dissolved oxygen. This condition is thought to develop in the "embayment" where the channel reaches the river. Efforts are being made to address the issue.

An extensive assessment of Middle Rio Grande water data last cycle (the 2010 list) by the Surface Water Quality Bureau (SWQB) indicates that PCB might be the only constituent added to the list in 2012. During this review cycle, the SWQB is taking a close look at the Upper Rio Grande, and preliminary assessments indicate that *E. coli* may be the only parameter to be added.

Overall water quality of the Rio Grande under normal flow conditions is good and the identified issues are largely related to *E. coli* and PCBs and these are generally wet weather (storm) water quality issues. They also are issues that are easily addressed in the processing of Rio Grande water for drinking water systems.

One study conducted in 2009[6] focused on collecting water samples from the Rio Grande at locations that would provide insight to water quality upstream from the BDD and the ABCWUA projects during wet weather events. Storm flows were expected to produce the highest levels of suspended sediment and subsequently the highest levels of contaminants for those constituents that are commonly bound to sediment particles (e.g., radionuclides, PCBs). Constituents typically found in storm water discharges from LANL were targeted to determine if past or current discharges from the Laboratory are detectible in the Rio Grande during storm flow events.

While the data evaluated does not indicate an influence from past LANL discharges on current water quality conditions in the Rio Grande near drinking water diversions the data were not sufficient to answer the same question when Los Alamos Canyon was discharging. Total PCB was below the human health and wildlife habitat water quality criteria at all four upstream locations but exceeded the criteria five times at Rio Grande above Alameda near Albuquerque.

[6] "Environment Department Finds Elevated Levels of PCBs in the Rio Grande near Albuquerque during Storm Flows," Ford-Schmid, R., Englert, D., 2010. http://www.nmenv.state.nm.us/doe_oversight/pubs.htm

Evaluations of the concentrations of total PCB and homologue[7] distributions of PCBs found in the Rio Grande above Alameda generated the following observations:

1. The PCBs measured in water collected from the Rio Grande during high flow storm water events were below the maximum contaminant level (MCL)[8] established in U.S. Environmental Protection Agency (USEPA) standards for drinking water. (Regular testing of Albuquerque's municipal water supply using USEPA authorized methods has not demonstrated the presence of PCBs.).
2. Total PCB exceeded the PCB human health and wildlife habitat water quality criteria[9] five times at Rio Grande above Alameda.
3. The median concentrations of PCB in suspended sediment from storm flow samples collected from the Rio Grande above Alameda are not representative of those found in the Rio Grande above Buckman Landing collected in this study and are two to three orders of magnitude greater.
4. The concentration of PCB in suspended sediment from storm flow samples collected from the Rio Grande above Alameda are not representative of upstream Rio Grande channel sediments sampled in previously studies (unpublished data);
5. The PCB homologue patterns found at Rio Grande above Alameda suggest that the PCBs found there are from a different source than those found upstream of Buckman Landing.
6. The PCB homologue patterns found at Rio Grande above Alameda are similar to those previously collected downstream of Albuquerque (unpublished data).
7. The PCB homologue patterns found at Rio Grande above Alameda are similar to those found in fish tissue samples[10] collected from the Rio Grande near Albuquerque.

[7] In chemistry, a homologue is a compound belonging to a series of compounds differing from each other by a repeating unit. Polychlorinated biphenyls (PCBs) are a class of organic compounds with 2 to 10 chlorine atoms attach to a biphenyl molecule. PCB homologues each have the same number of chlorine atoms.

[8] The MCL (maximum contaminant level) for PCBs in drinking water is derived from determinations of increased cancer risks per million people consuming a specified amount of water per day over a 70-year timeframe.

[9] The state human health criterion is based upon human consumption of fish and other aquatic life that bio-accumulate contaminants over time. The wildlife habitat criterion is determined based upon health risk to aquatic life living in the surface water.

[10] In conjunction with the New Mexico Department of Health and the Department of Game and Fish, NMED publishes fish consumption advisories for the stretch of the Rio Grande between I-25 to the south and US 550 to the north specifically because of PCB contamination. The advisories indicate that white bass from this area should not be consumed, and channel catfish between 14 and 18 inches should not be consumed more than three times per month. Fish advisories may be found on the NMED website at http://www.nmenv.state.nm.us/swqb/advisories/ and also in the New Mexico Department of Game and Fish fishing proclamation.

8. There is a positive correlation between total PCB and suspended sediment concentrations (SSC) at the Rio Grande above Alameda sampling location suggesting that the concentration of total PCBs may be predictable for this location if the SSC is known.
9. Additional PCB source investigations in the Albuquerque area may be needed.

Findings from this study also showed adjusted gross alpha (radiation) results exceeded the livestock watering criterion of 15 picocuries per Liter (pCi/L) once at each of the following locations: Rio Chama at Chamita (39 pCi/L), Rio Grande at Otowi (24 pCi/L), Rio Grande at Buckman (18 pCi/L), and three times at Rio Grande above Alameda (33 pCi/L, 32 pCi/L, and 21 pCi/L). There is a significant positive correlation of suspended sediment concentrations (SSC) to gross alpha measurements indicating that as SSC increases so will gross alpha proportionately.

Plutonium$^{239/240}$ was detected in seven water samples but the highest value found was 30 times less than the proposed water quality criteria. Evaluation of the plutonium$^{239/240}$ levels in the suspended sediments show they are indistinguishable from plutonium originating from integrated world-wide atmospheric fallout. There were no detections of cesium^{137} and strontium^{90}. In addition, concentrations of dissolved metals remained below their respective acute aquatic life criteria in all samples.

Stormwater Sampling

The DOE Oversight Bureau currently maintains or is trying to establish ten storm water monitoring stations within or below the Pajarito Plateau.

- Three stations are in the Los Alamos watershed (at or near LANL gage stations E050, E060, and E110);
- Four stations are on the Rio Grande above Cochiti Reservoir; and,
- Three stations are within the southern portion of the Pajarito Plateau.

E050 is located in the Los Alamos Canyon at the LANL eastern boundary just above the Los Alamos/Pueblo Canyon confluence. Upper Los Alamos Canyon is a source of legacy radioactive, PCB, and other contaminants, primarily from DP Canyon below Technical Area – 21 (TA-21), an old plutonium processing facility.

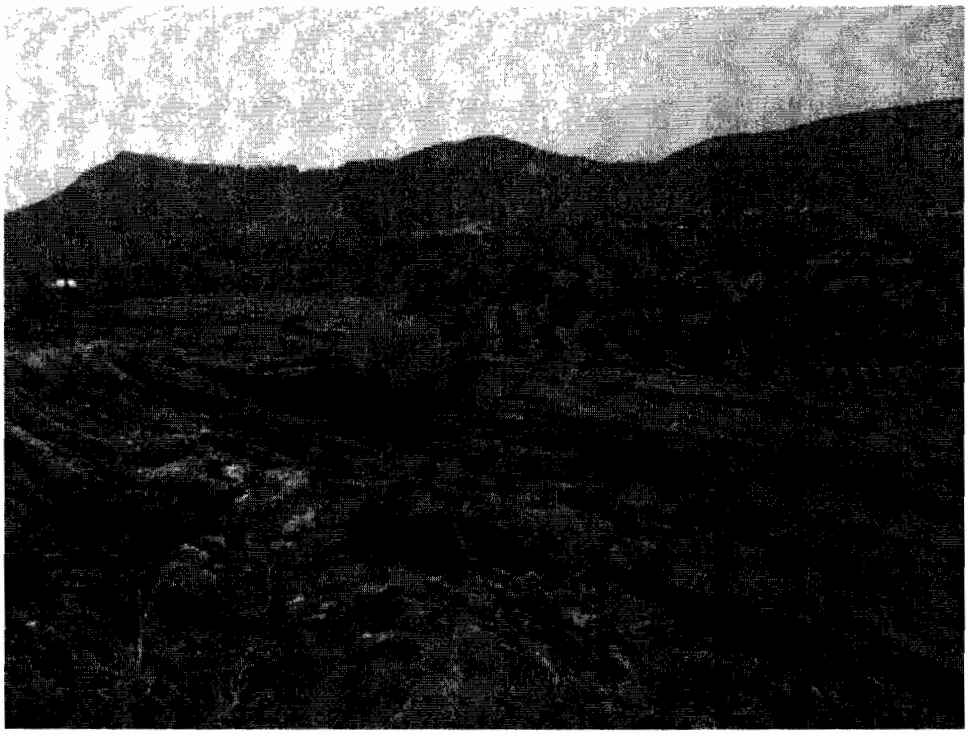
E060 is located in Pueblo Canyon at the LANL eastern boundary just above the Pueblo/Los Alamos confluence. Pueblo Canyon is a source of legacy radioactive

contaminants originating from Acid Canyon, sites for the original research and industrial discharge.

E110 is located downstream of LANL on San Ildefonso Pueblo property approximately ½ mile above the Rio Grande.

Stations on the Rio Grande include:

1. A station above the Otowi Bridge; just above the Los Alamos watershed/Rio Grande confluence. This device is programmed to collect regional storm events in the river.
2. Two stations are located at the Buckman Direct Diversion. One station is programmed to collect stormwater from regional storm events in the Rio Grande; the other is programmed to take timed samples when the Los Alamos watershed flows. A telemetric signal is received from E110 when Los Alamos flows. (In addition, the BDD maintains two automated samplers at this location; one is owned by BDD and the other is on loan from the Oversight Bureau.)
3. Another station is located on the Rio Grande in northern Albuquerque near the Alameda Bridge. It is a short distance above the ABCWUA drinking water diversion.
4. Stations within the southern Pajarito Plateau are being located in response to the recent Los Conchas fire.
5. A station is located in Peralta Canyon just above the Tent Rocks monument. Peralta Canyon goes into confluence with the Rio Grande below the Cochiti Reservoir. Stage and water quality will be monitored. A previous site had been located farther upstream but an extraordinary event washed away the Bureau's equipment.
6. A station is located in Bland Canyon on forest service land. Stage and water quality will be monitored. A previous site had been located farther upstream but has been abandoned. An unexpectedly large event destroyed access to the site. The Bureau monitoring equipment is also temporarily unavailable until access is reestablished.
7. A station had been located in Cochiti Canyon within the Dixon apple orchard. The station was demolished during large floods through the area. As of the middle of September the Bureau is still attempting to re-locate a new station.



Large stormwater flow event at Dixon Apple Orchard, August 22, 2012. Photograph by Kerry Jones.

Multiple large floods have occurred in canyons within the Pajarito Plateau. While the Bureau monitoring equipment has been largely unsuccessful in collecting samples or gaging flows during these events, staff is currently making indirect surveys to identify peak flows. The current stations have been replaced, fortified, and have been moderately successful in recording the less extreme flood events. Stormwater samples successfully collected, chemical analysis requested, and expected data delivery dates are shown in the table attached to this document.

Interagency Flood Risk Assessment Team

The New Mexico Environment Department's (NMED) Department of Energy Oversight Bureau is coordinating its stormwater sampling efforts with Los Alamos National Laboratory (LANL), the U.S. Army Corps of Engineers (USACOE), Cochiti Pueblo, Pueblo de San Ildefonso, Santa Clara Pueblo, and City/County of Santa Fe, and Buckman Direct Diversion staff. Other interested entities include the New Mexico Environment Department's Surface Water Quality Bureau, Sandia Pueblo, and the Albuquerque Bernalillo County Water Utility Authority (ABCWUA).

The Oversight Bureau and LANL have teamed with the New Mexico Department of Health to re-establish the Interagency Flood Risk Assessment Team (IFRAT) that was formed following the Cerro Grande Fire in 2000. The goal of the IFRAT is to collect and analyze data and distribute information to the public. This effort will help address some of the public's interest in risks associated with measured and potential contaminants in stormwater runoff and sediments and potential impact to drinking and irrigation water drawn from the Rio Grande.

The stormwater monitoring network at LANL consists of approximately 60 samplers at over 38 locations in the canyons and will collect runoff water from many of the burnout locations. In addition to LANLs network, four automated samplers are located at the Santa Fe/Buckman Direct Diversion (SF/BDD); one is owned by SF/BDD; one is loaned to the SF/BDD by the Oversight Bureau; and, the Bureau has two samplers deployed. All sampler programs are coordinated to gather samples at different times in response to different river flow inputs.

The coordinated effort between the Oversight Bureau, LANL, and others is to optimize sampling locations, maximize stormwater flow coverage, and minimize duplication of interagency effort. The interagency effort includes coordination of analyte lists (elements and substances to be sampled for) and coordinated laboratory analytical methods to ensure compatibility and comparability of data. Participating entities have also coordinated sampling regimes (at what point during the storm flow samples are collected) to enhance data comparability and help fill in data gaps. During the summer rainy season the primary focus is on stormwater and suspended sediment collection. In the autumn, when rains diminish, sample collection will transition to primary ash and soil sample collection. These data will allow comparison of constituents in ash, soil, suspended sediment, and stormwater.

Man-made radionuclides are part of the background due to global fallout from atmospheric weapons testing in the 1950s and 1960s and are measurable in sediments and soils. Some of these elements are the same as legacy contaminants from LANL which may be indistinguishable from what is present in the background. While measureable in the analytical laboratory, the levels are typically so low as to constitute no calculable risk.

Elements and isotopes that do not dissolve in water are not taken up by plants as nutrients but others that are soluble (various metals, strontium^{90}, and cesium^{137}) are present in vegetation, and consequently in ash when the plant material is burned. For example, polonium 210, a decay product of radon (itself in the uranium decay series), is commonly measured on the surface of vegetation (leaves, forest litter). Thus polonium is

measured at levels elevated above background when it is concentrated as the volume of vegetation is reduced to fire ash. This concentration of polonium is also demonstrated in tobacco ash.

Studies conducted in the aftermath of Cerro Grande showed that ingestion of plants grown directly in ash-containing flood deposits over a long period of time (30 years) may be associated with potential increases in chronic health problems, compared to plants grown in non-ash-containing sediment. This potential risk and the concern related to it can be reduced primarily by not using ash as a soil amendment in gardens in which food is grown. There was no marked difference in potential chronic health effects from swimming, fishing, or irrigation with ash-containing water versus water without ash.

Reports produced by the Oversight Bureau, Surface Water Quality Bureau and others are available on the Department's website (www.nmnev.state.nm.us) and the results from stormwater analysis is available on the RACER database (www.racerdat.com).

DOE OB Stormwater Samples Collected as of September 16, 2012

Water Samples taken to monitor Las Conchas flooding				Metals+B+U	SSC	CN	Gross Alpha	Gamma spec	Am-241	ISOPU	ISOU	Sr-90	Explosives	Dioxin/Furan	PCB Congeners
Sampling Station	**Collection Date**	**Retrieved Date**	**Submitted for Analysis**												
Analysis in sediments															
E050_9.16.11.01:48(W)	9/16/2011			x	x	x	x	x	x	x	x	x		x	x
E050_9.16.11.02:38(W)	9/16/2011			x	x	x	x	x	x	x	x	x			
E050_9.16.11.3:28(W)	9/16/2011			x	x	x	x	x	x	x	x	x			
E050_9.12.11.08:59(W)	9/12/2011			x	x	x	x	x	x	x	x	x		x	x
E050_9.12.11.09:49(W)	9/12/2011			x	x	x	x	x	x	x	x	x			
E050_9.12.11.10:39(W)	9/12/2011			x	x	x	x	x	x	x	x	x			
E050_9.10.11.02:10(W)	9/10/2011	9/12/2011		x	x	x	x	x	x	x	x	x		x	x
E050_9.10.11.03:00(W)	9/10/2011	9/12/2011		x	x	x	x	x	x	x	x	x		x	x
E050_9.10.11.03:50(W)	9/10/2011	9/12/2011		x	x	x	x	x	x	x	x	x			
Rio Grande @ BDD Regional-9.7.11.14:41	9/7/2011	9/12/2011		x	x	x	x	x	x	x	x	x			
Rio Grande @ BDD Regional-9.7.11.15:26	9/7/2011	9/12/2011		x	x	x	x	x	x	x	x	x		x	x
Rio Grande @ BDD Regional-9.7.11.16:11	9/7/2011	9/12/2011		x	x	x	x	x	x	x	x	x		x	x
Rio Grande @ BDD Regional-9.7.11.16:56	9/7/2011	9/12/2011		x	x	x	x	x	x	x	x	x			
E110-9.7.11.14:27	9/7/2011	9/7/2011		x	x	x	x	x	x	x	x	x			
E050-9.6.11.14:10	9/6/2011	9/8/2011		x	x	x	x	x	x	x	x	x		x	x
E050-9.6.11.15:00	9/6/2011	9/8/2011		x	x	x	x	x	x	x	x	x			
E050-9.6.11.15:50	9/6/2011	9/8/2011		x	x	x	x	x	x	x	x	x			
RG at Otowi-9.5.11.01:08(W)	9/5/11	9/6/2011	9/7/2011	x	x	x	x	x	x	x	x	x			
RG at Otowi-9.5.11.00:08(W)	9/5/11	9/6/2011	9/7/2011	x	x	x	x	x	x	x	x	x			
RG at Otowi-9.4.11.23:48(W)	9/4/11	9/6/2011	9/7/2011	x	x	x	x	x	x	x	x	x		x	x
E110.9.1.11.18:33(W)	9/1/11	9/6/2011	9/7/2011	x	x	x	x	x	x	x	x	x			
BDD.9.4.11.21:54(W)	9/4/11	9/6/2011	9/7/2011	x	x	x	x	x	x	x	x	x		x	x

DOE OB Stormwater Samples Collected as of September 16, 2012

Water Samples taken to monitor Las Conchas flooding				Metals+B+U	SSC	CN	Gross Alpha	Gamma spec	Am-241	ISOPU	ISOU	Sr-90	Explosives	Dioxin/Furan	PCB Congeners
Sampling Station	Collection Date	Retrieved Date	Submitted for Analysis												
BDD.9.4.11.21:55W)	9/4/11	9/6/2011	9/7/2011											x	x
BDD.9.4.11.22:44(W)	9/4/11	9/6/2011	9/7/2011	x	x	x	x	x	x	x	x	x		x	x
BDD.9.4.11.22:46(W)	9/4/11	9/6/2011	9/7/2011											x	x
E050.9.4.11.22:38(W)	9/4/11	9/6/2011	9/7/2011	x	x	x	x	x	x	x	x	x			
E050.9.4.11.21:48(W)	9/4/11	9/6/2011	9/7/2011	x	x	x	x	x	x	x	x	x			
E050.9.4.11.20:58(W)	9/4/11	9/6/2011	9/7/2011	x	x	x	x	x	x	x	x	x		x	x
E050.9.1.11.20:18(W)	9/1/11	9/2/2011	9/7/2011	x	x	x	x	x	x	x	x	x			
E050.9.1.11.19:28(W)	9/1/11	9/2/2011	9/7/2011	x	x	x	x	x	x	x	x	x			
E050.9.1.11.18:38(W)	9/1/11	9/2/2011	9/7/2011	x	x	x	x	x	x	x	x	x		x	x
Rio Grande above Alameda_8.17.11.21:47(W)	8/17/2011	8/18/2011	9/7/2011	x	x	x	x	x	x	x	x	x		x	x
Rio Grande at BDD_8.29.11.04:21(W)	8/29/11	8/30/2011	9/1/2011	x	x	x	x	x	x	x	x	x		x	x
Rio Grande at BDD_8.29.11.06:36(W)	8/29/11	8/30/2011	9/1/2011	x	x	x	x	x	x	x	x	x			
Rio Grande at BDD_8.29.11.05:06W)	8/29/11	8/30/2011	9/1/2011	x	x	x	x	x	x	x	x	x		x	x
Rio Grande at BDD_8.29.11.05:51W)	8/29/11	8/30/2011	9/1/2011	x	x	x	x	x	x	x	x	x			
Rio Grande at BDD_8.26.11.20:14W)	8/26/11	8/30/2011	9/1/2011	x	x	x	x	x	x	x	x	x		x	x
Rio Grande at BDD_8.26.11.21:04W)	8/26/11	8/30/2011	9/1/2011	x	x	x	x	x	x	x	x	x		x	x
E050_8.28.11.04:35(W)	8/28/11	8/29/2011	9/1/2011	x	x	x	x	x	x	x	x	x			
E050_8.28.11.03:45(W)	8/28/11	8/29/2011	9/1/2011	x	x	x	x	x	x	x	x	x			
E050_8.28.11.02:55(W)	8/28/11	8/29/2011	9/1/2011	x	x	x	x	x	x	x	x	x		x	x
Rio Grande at Otowi_8.26.11.21:00(W)	8/26/11	8/29/2011	9/1/2011	x	x	x	x	x	x	x	x	x			
Rio Grande at Otowi_8.26.11.19:40(W)	8/26/11	8/29/2011	9/1/2011	x	x	x	x	x	x	x	x	x		x	x
Rio Grande at Otowi_8.26.11.20:20(W)	8/26/11	8/29/2011	9/1/2011	x	x	x	x	x	x	x	x	x			
E110_8.28.11.20:41(W)	8/28/11	8/29/2011	9/1/2011	x	x	x	x	x	x	x	x	x			
Rio Grande @ Buckman_8.21.11.18:42(W)	8/21/11	8/22/2011	8/26/2011	x	x	x	x	x	x	x	x	x		x	x
Rio Grande @ Buckman_8.21.11.19:27(W)	8/21/11	8/22/2011	8/26/2011	x	x	x	x	x	x	x	x	x			
Rio Grande @ Buckman_8.21.11.19:29(W)	8/21/11	8/22/2011	8/26/2011	x	x	x	x	x	x	x	x	x		x	x
Rio Grande @ Buckman_8.21.11.20:19(W)	8/21/11	8/22/2011	8/26/2011	x	x	x	x	x	x	x	x	x		x	x

DOE OB Stormwater Samples Collected as of September 16, 2012

Water Samples taken to monitor Las Conchas flooding				Metals+B+U	SSC	CN	Gross Alpha	Gamma spec	Am-241	ISOPU	ISOU	Sr-90	Explosives	Dioxin/Furan	PCB Congeners
Sampling Station	Collection Date	Retrieved Date	Submitted for Analysis												
Rio Grande @ Otowi_8.21.11.18:11(W)	8/21/11	8/22/2011	8/26/2011	x	x	x	x	x	x	x	x	x		x	x
Rio Grande @ Otowi_8.21.11.18:51(W)	8/21/11	8/22/2011	8/26/2011	x	x	x	x	x	x	x	x	x			
Rio Grande @ Otowi_8.21.11.19:31(W)	8/21/11	8/22/2011	8/26/2011	x	x	x	x	x	x	x	x	x			
Rio Grande above Alameda_8.21.11.04:53(W)	8/21/11	8/22/2011	8/26/2011	x	x	x	x	x	x	x	x	x		x	x
Rio Grande above Alameda_8.13.11.04:53(W)	8/13/2011	8/16/2011	8/26/2011	x	x	x	x	x	x	x	x	x		x	x
E050_8.19.11.18:49(W)	8/19/11	8/20/2011	8/26/2011	x	x	x	x	x	x	x	x	x		x	x
E050_8.19.11.19:39(W)	8/19/11	8/20/2011	8/26/2011	x	x	x	x	x	x	x	x	x			
E050_8.19.11.20:29(W)	8/19/11	8/20/2011	8/26/2011	x	x	x	x	x	x	x	x	x			
E050_8.22.11.16:08(W)	8/22/11	8/24/2011	8/26/2011	x	x	x	x	x	x	x	x	x		x	x
E050_8.22.11.16:57(W)	8/22/11	8/24/2011	8/26/2011	x	x	x	x	x	x	x	x	x			
E050_8.22.11.17:47(W)	8/22/11	8/24/2011	8/26/2011	x	x	x	x	x	x	x	x	x			
E110_8.22.11.16:30(W)	8/22/11	8/24/2011	8/26/2011	x	x	x	x	x	x	x	x	x			
E110_8.22.11.17:20(W)	8/22/11	8/22/2011	8/26/2011	x	x	x	x	x	x	x	x	x			
Peralta.8.24.11.17:15(W)	8/24/2011	8/25/2011	8/26/2011	x	x	x	x	x	x	x	x	x			
E110 7-22-11	7/22/11	7/27/2011	7/28/2011	x	x	x	x	x	x	x	x	x			
Rio Grande @ Buckman-7-28-11 19:06	7/28/11	7/28/2011	8/2/2011	x	x	x	x	x	x	x	x	x		x	x
Rio Grande @ Buckman-7-28-11 19:56	7/28/11	7/28/2011	8/2/2011	x	x	x	x	x	x	x	x	x		x	x
BDD-8-3-11 18:09 (water)	8/3/11	8/4/2011	8/11/2011	x	x	x	x	x	x	x	x	x		x	x
BDD-8-3-11 18:59 (Water)	8/3/11	8/4/2011	8/14/2011	x	x	x	x	x	x	x	x	x		x	x
BDD-8-5-11 17:54 (Water)	8/5/11	8/4/2011	8/17/2011	x	x	x	x	x	x	x	x	x		x	x
BDD-8-5-11 18:44 (Water)	8/5/11	8/4/2011	8/20/2011	x	x	x	x	x	x	x	x	x		x	x
E110-8-5-11 14:47 (Water)	8/5/11	8/4/2011	8/23/2011	x	x	x	x	x	x	x	x	x			

Integrated Post-Las Conchas Monitoring Los Alamos National Laboratory

Buckman Direct Diversion Board

Monthly Board Meeting

October 6, 2011

Los Alamos NATIONAL LABORATORY EST. 1943

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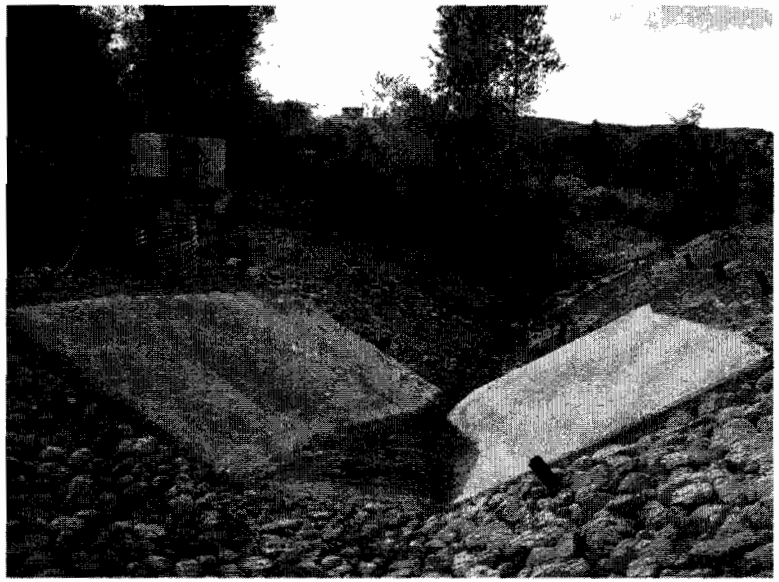
Integrated Post-Las Conchas Monitoring - Los Alamos National Laboratory

- **Multiple Organizations are collecting data**
  - NMED
  - Buckman
  - LANL
  - Albuquerque Water Utility
- **Integration**
  - Data collection methodologies
    - How to effectively collect samples under challenging conditions
    - Comparable data sets enable integration for risk assessment
  - Coverage across the burn area
    - LANL (upstream and downstream)
    - Rio Grande
    - Elsewhere below burn area
  - Data Types
    - Storm water runoff
    - Sediment
    - Rio Grande



Integrated Post-Las Conchas Storm Water Monitoring - Project Goals

Goal of Integrated Monitoring Effort

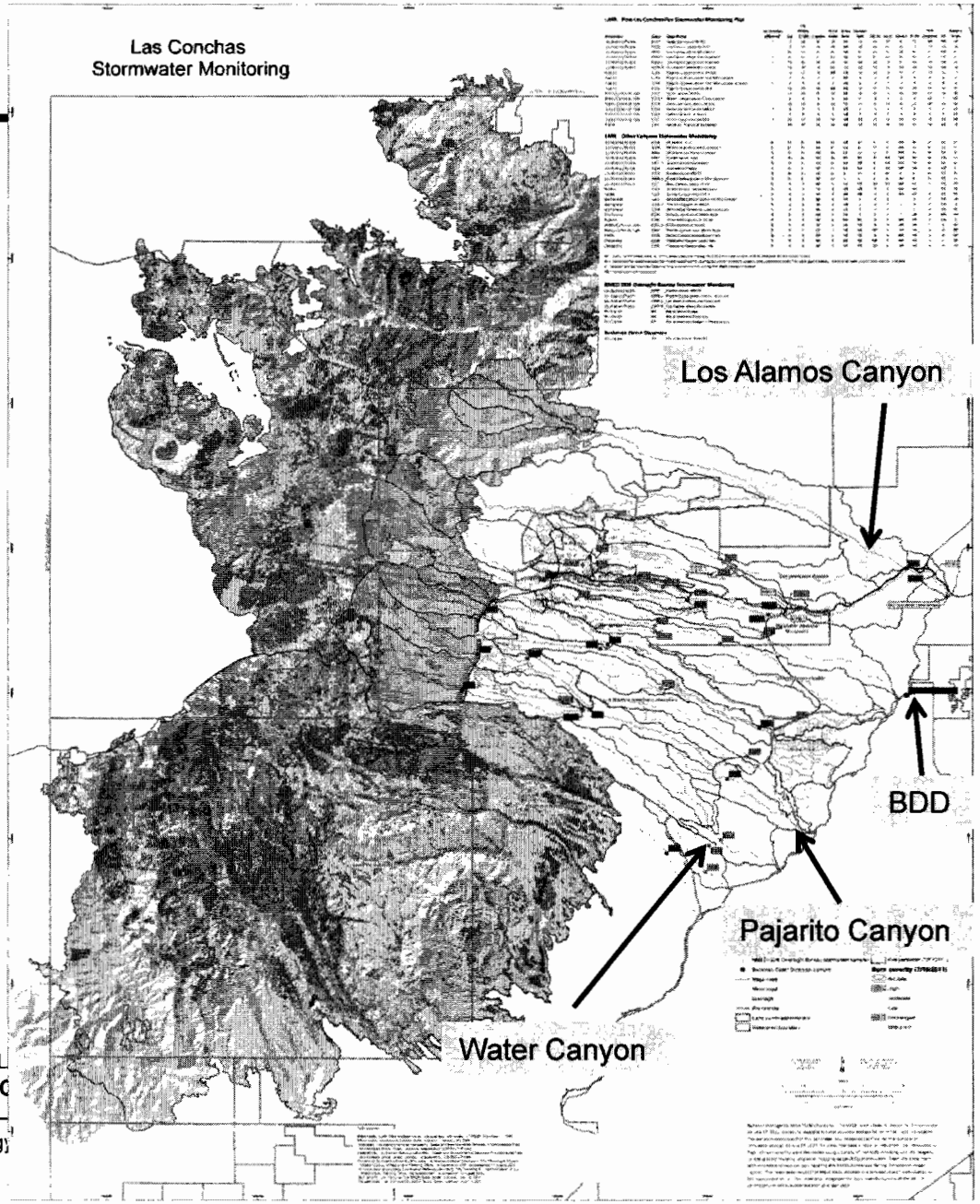
- Establish a data set that enables assessment of risks and guides actions to protect water resources, and human and ecological health
- Inter-Agency Flood Risk Assessment Team

LANL goals

- Evaluate potential LANL contributions to contamination observed in storm water, and
- Take actions necessary to mitigate risks and repair damage associated with post-fire runoff

Integrated Post-Las Conchas Storm Water Monitoring – LANL Sampling Plan

- LANL sampled from areas upgradient (unaffected) by LANL operations to characterize "natural" constituents in ash and soils
- Some interior sampling stations were damaged by August floods.
- Boundary stations all remain operational



Integrated Post-Las Conchas Storm Water Monitoring – Samples Collected by LANL to Date

- **LANL has collected samples from 21 different days with runoff**
- **Samples collected from:**
  - Locations upstream (unaffected) of LANL operations
    - Helps characterize constituents found in ash and mountain soils
  - Canyons immediately north and south of LANL, also unaffected by LANL operations
    - Helps characterize constituents found in ash and mountain soils
    - Helps understand how concentrations in runoff change downstream from burn area
  - Downstream LANL boundary locations above and below Buckman Diversion
    - Only Los Alamos Canyon joins the Rio above Buckman

Integrated Post-Las Conchas Storm Water Monitoring – Sample Results Overview

- **Constituents observed at locations unaffected by LANL are consistent with observations from similar locations after Cerro Grande**
  - Some results exceed State water-quality standards
  - Cyanide, Dioxins/Furans – source is combustion of organic material in burn area
  - Metals – source is plant uptake of constituents found in soils
  - Radionuclides, PCBs – concentrated from global fallout deposited on forest floor
- **Observations at lower LANL boundary locations, including E109.9**
  - Cyanide and PCB concentrations are generally lower. Some still exceed standards
  - Metals, Radionuclides, Dioxins/Furans – similar concentrations as samples above LANL
- **Results received to date are in RACER, remainder within several weeks**
- **Data is being integrated with NMED, BDD, and Albuquerque water utility for use in IFRAT Risk assessment**

POST LAS CONCHAS FIRE STORMWATER AND WATER QUALITY MONITORING

By
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Buckman Direct Diversion Project

Post Las Conchas Stormwater Monitoring Efforts

The BDD has implemented conservative and vigorous stormwater and water quality monitoring including:

- sampling of Rio Grande water when
  - The ENS system is activated
  - Non-LANL Ash events
  - Non-LANL / non-ash events pass by the BDD diversion structure
  - Finished drinking water
- Testing of raw water and finished drinking water for hundreds of parameters by certified independent laboratories

Sample Collection and Analytical Data

- The BDD follows federal protocols for sample collection established by US EPA
- Samples are collected by experienced and Certified Sample Collection Technicians
- Samples are analyzed by accredited and certified independent laboratories
- Analytical data is carefully reviewed and validated
- Data monitoring information is made available to the public at:
  - www.racerdat.org
  - www.bddproject.org
  - www.nmenv.state.nm.us/swqb/MAS
  - www.nmenv.state.nm.us/doe_oversight/pubs.htm

BDD Stormwater and Finished Drinking Water Sampling Events since July 2011

Date	Time	Storm Event Origination	Ash Event	Samples Collected	Analyses Requested
07/15/11	11:25	Santa Clara Canyon (presumed)	Yes	Yes	total and dissolved Cs137, Sr90, Pu238, Pu239/240
07/22/11	**23:34**	**ENS - Guaje Canyon**	**Yes**	**Yes**	**LANL MOU, VOCs**
07/25/11	18:43	Santa Clara Canyon (presumed)	No	Yes	gross alpha, gross beta, metals, VOCs, alkalinity
07/26/11	8:48	Santa Clara Canyon (presumed)	Yes	Yes	gross alpha, gross beta, metals, VOCs, alkalinity
07/27/11	4:06	Santa Clara Canyon (presumed)	No	Yes	gross alpha, gross beta, metals, VOCs, alkalinity
07/28/11	2:06	Santa Clara Canyon (presumed)	Yes	Yes	gross alpha, gross beta, metals, VOCs
07/28/11	**17:36**	**ENS - Guaje Canyon**	**Yes**	**Yes**	**LANL MOU, VOCs, Cyanide, Nitrate, alkalinity**
07/29/11	1:10	Santa Clara Canyon presumed)	Yes	Yes	gross alpha, gross beta, metals, VOCs
07/29/11	8:20	Santa Clara Canyon (presumed)	Yes	Yes	gross alpha, gross beta, metals, VOCs
07/30/11	7:00	unknown	No	Yes	gross alpha, gross beta, metals, VOCs, Cyanide, Nitrate, Nitrite, alkalinity
08/01/11	5:00	unknown	No	Yes	gross alpha, gross beta, metals, VOCs, Cyanide, Nitrate, Nitrite, alkalinity
08/03/11	**16:15**	**ENS - Guaje Canyon**	**Yes**	**Yes**	**LANL MOU, VOCs, Cyanide, Nitrate, alkalinity**
08/05/11	10:50	Santa Clara Canyon (presumed)	yes	yes	gross alpha, gross beta, metals, VOCs, Cyanide, Nitrate, Nitrite, alkalinity
08/05/11	**16:24**	**ENS - Guaje Canyon**	**Yes**	**Yes**	**LANL MOU, VOCs, Cyanide, Nitrate, alkalinity**
08/18/11	0:30	unknown	No	Yes	gross alpha, gross beta, metals, VOCs, Cyanide, Nitrate, Nitrite, alkalinity
08/19/11	21:10	unknown	No	Yes	gross alpha, gross beta, metals, VOCs, Cyanide, Nitrate, Nitrite, alkalinity
08/21/11	**17:29**	**ENS - Guaje Canyon**	**Yes**	**Yes**	**LANL MOU, VOCs, Cyanide, Nitrate, alkalinity**
08/24/11	15:01	BASELINE STUDY	N/A	Yes	LANL MOU, CN, NO3, alkalinity
08/26/11	**18:14**	**ENS - Guaje Canyon**	**Yes**	**Yes**	**LANL MOU, VOCs, Cyanide, Nitrate, alkalinity**
08/27/11	**16:51**	**ENS - Guaje Canyon**	**Yes**	**Yes**	**LANL MOU, VOCs, Cyanide, Nitrate, alkalinity**
[redacted]					
09/01/11	**18:09**	**ENS - Guaje Canyon**	**Yes**	**Yes**	**LANL MOU, VOCs, Cyanide, Nitrate, alkalinity**
09/04/11	**19:55**	**ENS - Guaje Canyon**	**Yes**	**Yes**	**LANL MOU, VOCs, Cyanide, Nitrate, alkalinity**
[redacted]					

non-LANL, non-ash event
non-LANL, ash event
ENS event

Drinking Water Samples Fully Compliant with Federal Standards

- Finished Drinking Water results were well below Safe Drinking Water Standards (SDWA)
  - gross alpha - ranged from undetectable to 3.0 pci/L
  - gross beta - 2.98 to 4.16pci/L
- All other parameters including metals, organic and inorganic compounds were below Safe Drinking Water Standards

River Stormwater Samples

Contaminants Connected to Sediments

- Aluminum
  - Unfiltered samples revealed increased levels of (22 – 100mg/L)
  - Filtered samples had levels lower than the standards (0.05 – 0.2mg/L)
- Radionuclides
  - Unfiltered samples revealed increased levels of gross alpha (2.1 to 71pci/L) and gross beta (2.06 – 74pci/L)
  - Filtered sample levels were undetectable for gross alpha and ranged from undetectable to 4.16pci/L for gross beta
- VOCs

  Unfiltered samples had concentrations lower than the Safe Drinking Water Standard

Information Sharing

- Data monitoring information is made available to the public at:
  - www.bddproject.org
  - www.racerdat.org
  - www.nmenv.state.nm.us/swqb/MAS
  - www.nmenv.state.nm.us/doe_oversight/pubs.htm

Summary

- The BDD has implemented a very conservative approach regarding when to cease Rio Grande water diversion
- The BDD drinking water meets all SDWA standards and is safe to consume
- The BDD will continue its extended stormwater, raw water, and finished water monitoring
- The BDD is committed to transparency and data sharing to protect public health and consumer confidence