

Community Advisory Council
May 13, 2010
Action Items/Notes

Final

These notes are in the following order:

1. Attendance
2. Correspondence and Handouts
3. Administrative Items
4. Presentation on SPDES Permit Modification Study
5. Presentation on Groundwater Recharge Study
6. Agenda Setting
7. NASA presentation by Victor Schneider, MD, and Francis Cucinotta, PhD
8. Community Comment
9. NASA Research Proposal Discussion

1. Attendance

Members/Alternates Present:
See Attached Sheets.

Others Present:

J. Amabile, L. Bates, M. Bebon, P. Bond, G. Borrusso, J. Borrusso, M. Burke, E. Cappelletti, J. Carter, K. Cerny, W. Cerny, E. Clark, F. Cucinotta, J. D'Ascoli, N. Detweiler, D. Feldman, R. Flaccomio, J. Flamendorf, L. Garber, K. Geiger, P. Genzer, D. Gibbs, T. Gismondi, N. Gittell, B. Grandal, M. Holland, M. Israel, P. Judd, A. Kessler, Y. Kravitz, S. Kumar, B. Lee, G. Lozada, P. Lozada, M. Lynch, D. McGinness, R. McKay, B. Neumann, D. Paquette, S. Penn, J. Percifield, C. Pragliola, G. Proios, A. Raff, J. Remien, M. Ruis, C. Rutkowski, D. Scharfschwerdt, V. Schneider, L. Silvestro, J. Sims, I. Smith, P. Stapleton, J. VanMiddeltem,

2. Correspondence and Handouts

Items one and two were mailed with a cover letter dated May 7, 2010. Items three through five were available as handouts at the meeting.

1. Draft agenda for May 13
2. Draft notes for April 8
3. Copy of SPDES Permit Modification Study presentation
4. Copy Groundwater Recharge Study presentation
5. Copy of NASA presentation to the CAC

3. Administrative Items

The meeting began at 6:35 p.m. Reed Hodgkin, facilitator, noted that there was additional seating in an overflow area set up with a monitor in the North Room. He reviewed the ground rules and the agenda. Those in attendance introduced themselves. Hodgkin asked the CAC to revise their agenda to put the NASA presentation before Community Comment.

Approval of Minutes

Hodgkin asked for corrections, additions, or deletions to the April 8, 2010 draft notes. Member

Shea said that on page 2, it should say that she had seen a series of articles on nanotechnology and would like to share that information with the CAC, not would like more information. The notes were approved as amended with two abstentions.

4. SPDES Permit Modification Study, Robert Lee, Environmental Protection Division

Bob Lee, Environmental Protection Division, reminded the CAC that last year the New York State Department of Environmental Conservation (NYSDEC) proposed significant modifications to the Lab's SPDES permit, to further reduce metals in treated waste water that is released into the Peconic River, prior to its renewal. The renewal process was started in August 2008 with the submission of analytical data. The State asked that the Lab try to achieve water quality-based effluent limits for metals. The State also required the Lab to conduct a Quantification and Removal Study and a Mercury Minimization Program.

Lee explained that Study results which looked at sources of metals, evaluated treatment options, evaluated alternative disposal options, and recommended options to achieve the limits. The studies were conducted by the firm of Dvirka and Bartilucci. The field work was done from September through December 2009. Sampling events were conducted weekly at 42 locations onsite for three months and flow measurements were made in order to estimate the mass contribution of each source to the Sewage Treatment Plant (STP).

Lee explained where the sampling took place and how the Lab would fare if the new treatment limits were imposed on the Lab. He described the average concentrations currently, the former permit limits, the interim limits, and the new target limits. He said that the Lab would have a lot of challenges meeting the target limits.

Lee described the STP profile for mercury. He said that the sand filters are a contributing source of mercury in the discharge.

Member Esposito asked how old the sand filters are and how deep are they.

Lee said that they were installed in 1967 as part of an upgrade. The top 18 inches of sand was cleaned out last summer. There is three feet of sand filter medium under laid with gravel and imbedded pipes for a depth of about 4.5 feet.

Lee explained that the studies showed the major sources of metals which are boiler blow down and sanitary waste. He discussed source control recommendations for the metals (copper, lead, zinc, iron, and nickel) and a phased approach for reducing mercury.

Lee said there were two different disposal options for the STP that Dvirka and Bartilucci (D&B) looked at – continued discharge to the Peconic and redirecting discharge to groundwater. He explained the pros and cons of treatment options that could reduce the metals – chemical precipitation, ion exchange, and chemical and other absorption systems.

Member Esposito asked if the resin used for ion exchange would be toxic if it is discharged into a fresh body of water so that there is mixing and dilution.

Lee said there is no mixing and dilution in the river at the discharge point. Typically, from May through September there isn't much flow in the Peconic.

The recommended alternative from D&B for the STP treatment upgrade is use of a chemical called polythiocarbonate. It is the easiest to implement and is cost effective. The cost is estimated to be \$2.3M. The second alternative is to abandon the existing sand filters and go

directly from the secondary clarifiers to new recharge basins. Four new recharge basins would be needed. The cost is estimated to be \$570,000. The effluent would meet the groundwater discharge limits.

Member Esposito said that this is very complicated material. She asked if for this particular option, if the filtering is bypassed, why it has to be four basins with no pre-filtration. What if you did the filtering and then discharged it?

Lee said pre-filtering would reduce the square footage by half.

The final recommendation from D&B is that the Lab go to groundwater discharge. The effluent will meet discharge standards without additional treatment, the effectiveness of the STP treatment alternatives is not proven, the impacts are unknown, and the treatments are costly and labor intensive.

Lee explained the Lab's comments on the draft report. The comments are that the report presumes that the water quality-based effluent limits (WQBELs) must be met, could improvement be achieved if just one of the options is added to the end of the STP process (replacing existing filters), and that treatment alternatives should be evaluated prior to groundwater recharge as there is the potential for accumulation of metals in the recharge basins. BNL is also concerned that the cost estimates are too low.

5. Groundwater Recharge Study, Douglas Paquette, Groundwater Protection Group

Doug Paquette, Environmental Protection Group, explained the Groundwater Recharge Study. He said that as part of the study, the historical river flow information was reviewed, modifications to the on-site river flow were studied, current flow conditions were observed, recharging the effluent to three recharge areas was modeled, and a preliminary assessment of possible impacts to aquatic organisms was conducted.

Member Giacomaro asked for clarification that the STP was constructed in 1917.

Paquette said it was built by the Army and has, of course, been upgraded since then.

Paquette then described the current conditions of the Peconic River. He said it is a seasonal intermittent stream and that most of the water in the river is groundwater. He explained the impacts of wet and dry periods on the river and its flow. During wet conditions the start of the flow of the river is upstream of the STP and in dry conditions the river flow could begin as far as one mile to the east of the STP outfall. He showed several pictures illustrating the conditions. He said that below the outfall there is some water in the stream all the time because of discharge.

Paquette said that BNL's groundwater model was used to determine what the impacts might be to recharging the water into an area that was away from the river. The current conditions were reviewed and if the treated waste water was discharged in three other upland locations was looked at. It was determined that there would be no on-site flow during periods of low precipitation from any of the three locations. The modeling suggested the best location for recharge was the former filter bed area to the east of the STP.

Paquette described potential impacts to flora and fauna and the conclusions. He said that a NEPA review would be required if BNL selects the groundwater recharge option.

Bob Lee explained the next steps. BNL's comments and those from the community and regulators will be incorporated into the final draft. The final draft will be reviewed. The report is expected to be finalized by mid-June and it is due to the State by July 1, 2010.

Once the report is received, there will be discussions with the State. The Revised Permit will be subject to Public Notice, so you will be given the opportunity to review the revised permit and provide your comments. Once the comments and State recommendation is complete, the alternative will be implemented.

Member Garber commented on the difference between the presentation tonight and the one at the Workshop Monday night. He said the County tertiary plant discharges into Port Jefferson Harbor and is under a directive to reduce their effluent by 50 per cent. They thought about groundwater injection upstream where in 12 years it will reach the Sound. They were appealing to get that restriction removed. The Village of Greenport had a similar situation and they appealed and were awarded relief. The Peconic river is categorized by either as a Class C or D river with dramatically different effluent limits having to do with continuous flow or intermittent flow primarily, and if it was open for reconsideration given that the consideration is very arbitrary you could get different standards.

If you get rid of the sand filters and then you saw what the effluent would be in the dry period the metals would go into the ground, get absorbed by the sand within the Lab site else where. In the high flow periods of time, the effluent would be greatly diluted as we've seen so I was thinking that might be open for consideration.

Lee said the Class C, Class D argument was lost back in 1988. We haven't tried to reopen that issue. The Peconic is one of the rivers protected under the State's Wild, Scenic and Recreational Rivers Act, I don't suspect that is an avenue we would like to go down. As far as some of our discharge recharges groundwater today, but to try to implement two different types of limits, would be very difficult. The reason behind the low limits is to protect fish.

Member Mannhaupt said she didn't think she'd ever see such low numbers going into the Peconic. She asked about the large mouth bass and chain pickerel populations in the upper section of the river.

Lee said that they are picked up in the sampling each year, but the largest we see are around 6 inches. This would impact their ability to reside in the upper portions of the river if it were to dry out. The banded sunfish are more acclimated to this portion of the river than the larger fish.

Member Mannhaupt commented that it would not be a good thing to lose the fish.

Member Peskin asked about the comment that the cost estimates were low. How could the actual costs be twice as high as the estimates? What is the difference between D&B estimates and BNL's? We've done this and have some experience, but so has D&B.

Lee said that their cost estimates assumed minimal equipment was needed. We will need facilities to house the equipment and it is a large facility and it has an infrastructure that needs to be supported.

Member Esposito said that she was very glad to hear that the Lab is not going to pursue downgrading the classification of the river. I normally don't ever speak for the entire environmental community across Long Island but I feel very comfortable saying that that would be met with adverse reaction. We don't want to downgrade the classification of a river so that we add more pollutants to it. That would probably not be a good move on the part of the Lab.

She asked how the three different scenarios were arrived at for the recharge areas, particularly the area 2,700 feet to the west. And I'm struggling with, I thought I heard you say, that the reason you found the old filter beds the most favorable option is that they didn't then influence groundwater discharge into the river. This is a deep flow recharge area, it seems like the river would be pulling from that area so it seems counter-intuitive to groundwater flow.

Paquette said the decision to go to the western area, was because that is currently an open area where we wouldn't have to modify or cut down trees. There's an open area where we could dig out the soil and create the filter bed areas. In that scenario, because there's an elevation change going upwards, we would wind up having to pump the water from the plant up to that area. One of the other issues is where that water is recharging is within one of our capture zones for one of our drinking water supply wells. It was an area that was available to us.

Regarding the filter bed areas, the current filter bed area that we are using is underlain by near surface clay and silt. That area, even with the 20 percent loss that we see across the bed, creates what we refer to as a groundwater mound. If we were to put 80 percent more into that area, the groundwater mound would get even larger and you would definitely, year round, get water that would make its way back into the river. The area that we chose for consideration, we do have to do some additional geotechnical borings, to ensure that we understand what the infiltration rates are. What we currently understand is that the water would infiltrate into the ground more readily and that's why we chose that area.

Member Talbot expressed concern about the May 21 date for finalizing the draft document. He said there is an awful lot of material and a tremendous amount of options available. He asked where the other comments came from, what was the source?

Lee said that they met with NYSDEC Region I to go over the study just as we are going over it with you tonight. Their comment was that they would like to see what the expected treatment efficiency would be. What levels could BNL achieve?

Member Anker said she is concerned about mercury flowing downstream. She asked if there were signs posted to warn fishermen.

Lee said one of the benefits of going to groundwater discharge is that it takes the mercury discharge out of the river. A cleanup was completed in 2005 to remove sediment to the river and it seems they will be doing more of that. The concentrations of mercury in the fish that we have found in the follow-up to the 2005 cleanup are not that high. The cleanup appears to be very effective, so posting warning signs is not necessary.

Member Sweet asked for clarification on the wording of the slide that states that there will be no on-site flow during periods of low precipitation. Does that mean there will be flow during periods of high precipitation, which will cause the discharge to go into the river?

Paquette said during periods of high precipitation there will be flow along that stretch of the river and the water table will rise, but it will not be enough to cause the discharge to go back into the river.

Member Mannhaupt said if you decide to use the groundwater recharge option, you have to find a way to keep the fish here onsite.

Lee said during wet periods the fish will have free range to swim up and downstream, during dry periods, the fish will naturally migrate off-site.

Member Biss said there has been an unusually high level of water this year; you can't count on it being this high in the future.

Member Esposito asked if BNL has any sense of what level you could get the heavy metals down to if you replace the sand filter beds.

Lee said we expect the numbers to come down, but we don't know to what level.

Member Graves asked if you could design the recharge basins to act as wetlands habitat.

Lee said we are looking at all the options.

Reed asked if the CAC would like to make a recommendation.

Member Schwartz asked if the comment would come from the CAC as a whole.

Reed said there could be discussion and then we will gather individual comments and/or a consensus recommendation.

Member Mannhaupt said the final report is due June 15 and it goes to the regulators on July 1.

Member Esposito said we need to be respectful of the 40 people here tonight that would like to make comment, so I would like to request a one month extension on behalf of the CAC.

Lee said we will go to the State with that request. I don't see a problem.

Reed asked if the CAC would like to continue the discussion next month.

CAC indicated that they would.

Reed said we will put it on the agenda for next month and asked if any additional material was needed.

Member Esposito suggested forming a subcommittee that could make a recommendation to the CAC.

Member Mannhaupt said that is a good idea.

Member Esposito asked what members are interested in being on this subcommittee.

Members Mannhaupt, Graves, Garber, Anker and Esposito agreed to serve on the subcommittee.

6. Agenda Setting

Jeanne D'Ascoli, BNL liaison to the CAC, said she would like to reserve making a decision about next month's agenda until the program this evening is completed. Next month there will be discussion on SPDES. There is a presentation on the Peconic River, which may be in July. She will send out the draft agenda once decisions are made.

7. NASA Presentation, Victor Schneider, MD, and Francis Cucinotta, PhD

Victor Schneider, Senior Medical Advisor for the Human Research Program at NASA

Headquarters in Washington DC and Dr. Francis Cucinotta, head of the Radiation Biology Research Program for the Human Research Program at the Johnson Space Center, Houston Texas gave a presentation to the CAC. They described the NSRL Program (NASA Space Radiation Laboratory) at Brookhaven National Lab and answered some of the questions that the CAC had given them.

Schneider said that NASA is directed by the President and Congress to address challenges in human space exploration and is charged with addressing the human health risks associated with exposure to space radiation. He said astronaut health is a critical priority at NASA and this research proposal, "Long term effects of space radiation in non-human primates," will focus on one of the most important unknowns: the effect of space radiation on the central nervous system.

One of NASA's goals is to keep the U.S. competitive and improve the lives of its citizens. He said the Mission to Mars was set forth by the Bush Administration previously and the Obama Administration currently. He explained that all space radiation research studies are solicited nationally based on recommendations from the National Academy of Sciences and National Council on Radiation Protection and Measurements and are selected using a rigorous, independent peer review process. Currently there are no existing data sources that can provide the needed information and there are no other research methods that can provide this information. It would be unethical to send people on long-duration spaceflights beyond low-Earth orbit without first defining radiation exposure limits. He said NASA is concerned for both human and animal welfare, and the Agency continues to be committed to the humane and ethical treatment and care of all subjects that are studied.

Cucinotta gave the CAC some background information on the science and explained that there are different sources of space radiation. The problem is that with this type of radiation, we know what it does to us physically, but not biologically. The Sun emits solar particle events which occur sporadically. There is also trapped radiation, which interacts with the Earth's magnetic field and the atmosphere, and gets trapped in the magnetic field. We are less concerned with these two sources of radiation, they are mostly protons and they only penetrate a few centimeters. The Galactic Cosmic Rays are the ones we are most concerned about and these can be simulated at Brookhaven National Lab. These consist of high energy protons and heavy ions (HZE). Their energies approach the speed of light so the amount of material needed for shielding would be several meters. There is unique damage to biomolecules, cells, and tissues that occur from HZE ions that is qualitatively distinct from x-rays and gamma-rays on Earth. There is no human data to estimate the risk from heavy ions. A lot of work has already been done with cells and lower species. Animal models must be applied or developed to estimate cancer and CNS (central nervous system) and other risks. The NSRL at BNL is critical to enabling deep space missions because it is one of the few places in the world that can simulate the harsh cosmic and solar radiation environment found in space.

Currently a Mars mission is projected to exceed NASA safety guidelines for astronauts by a large margin. The four categories of risk of concern to NASA are carcinogenesis, acute and latent central nervous system risks, chronic and degenerative tissue risks, and acute radiation risks. The accumulated evidence from the reported studies on DNA damage, loss of neurons, and altered behavior and motor function requires a careful assessment of the total risk to the CNS from exposure to high atomic number and energy (HZE) particles. NASA must follow the ALARA (as low as reasonably achievable) principle to ensure astronauts do not approach dose limits. The need for non-human primate subjects was determined after reviewing current and previous recommendations from the National Academy of Sciences and the National Council on Radiation Protection and Measurements as well as other NASA advisory groups. Preliminary studies evaluating the effects of high-energy radiation equivalent to a human on a mission to

Mars have been completed on cells and mice and have raised concerns on the adverse health effects of space radiation. Data on high-energy cosmic ray radiation effects on the central nervous system does not yet exist.

Schneider explained the process for NASA research proposals. He spoke about the IACUC (Institutional Animal Care and Use Committee) and the ethics assessment. He said that in the case of this research study, reviews by external biomedical ethicists have concluded that the study is compliant with NASA guidelines. Following the successful peer review of the proposal in question, NASA reviewed the proposal to confirm that it fulfilled the requirements of the solicitation, would provide critical data needed to protect human lives in deep space, and the IACUC at the Principle Investigator's (PI) home institution had approved the protocol within the required timeframe. NASA was satisfied with the ethics of this particular proposal and selected it. Negotiations with the PI and his institution on the process for use of the NSRL at BNL began.

Cucinotta said that the new knowledge that will be obtained on risk assessment for astronauts will also benefit others exposed to radiation and this research should help with early detection of CNS cognitive dysfunction including Alzheimer's disease.

Schneider concluded by saying that NSRL is a critical facility that enables NASA's mission and the Agency has been, and remains, committed to the humane and ethical treatment and care of all animals associated with the U.S. space program.

Member Mannhaupt asked about dose-based models for space radiation. She also asked why these monkeys are being used and what their parallel to human beings is.

Cucinotta said there are a lot of short-comings using dose-based models. The structure of the brain of the squirrel monkey overlaps 80% with humans. The tests are transferrable to human beings. They are not a perfect model, but there are more overlaps than with other models. There are others that could give similar data, but these were the models used in this proposal.

Member Shea said that even low level radiation is harmful. How does the shielding of a two pound monkey correlate to humans? She also asked how the crew safety limit of 3% above the normal cancer rate would be determined and over what time period.

Cucinotta said NASA does not allow more than a lifetime risk of 3% of dying of cancer from radiation for its astronauts. The squirrel monkey has a similar structure of the cortex of the brain as humans, so there are cognitive changes that you wouldn't see in mice or rats. They are the best model we can use. Shielding is a different issue because of their small size.

Member Talbot asked how one dose relates to long term exposure.

Cucinotta said the dose rate doesn't matter because neurons don't change over time. There is very little or no repair over time.

Member Biss asked if NASA has tried getting information from people that have worked for years around microwave tubes.

Cucinotta said that is a different type of radiation, NIH and EPA are concerned about that. That is non-ionizing radiation which is quite different from what we are studying.

Member Esposito said if this species is so similar to humans is it reasonable to assume that they feel pain like we do.

Schneider said yes. However, our goal is not pain and suffering and the dose is low enough that IACUC is satisfied that this is a not a painful proposal.

Cucinotta said there will be no pain or discomfort from being irradiated.

Member Esposito asked when was the last time any agency in the United States used primates for space travel research.

Schneider said 1996.

Member Chaudhry asked how this study will open new horizons. He also asked if shielding is not used, what other type of protective device can be used.

Cucinotta said this type of measurement can be easily translatable to humans. Shielding is only one option, we need to find out what part of the brain is affected and then also pursue pharmaceutical options or shorter missions.

Member Sprintzen commented that if we can do these missions robotically, we don't need this experiment.

Schneider said, currently our National Policy is to have human exploration in space.

Member Mannhaupt asked if the crew's safety has a limit of 3% cancer risk, what is the monkey's dose to keep their risk below 3%? If the Mars mission is in 2028, that's 18 years away. How long will the monkeys be around to get the data?

Cucinotta said the proposal will be funded initially for four years and then could be continued if it passes peer reviews. If the mission is not continued, the monkeys will stay at McLean Hospital.

Schneider said we know what the dose limits should be to prevent the 3% cancer risk. The dose the monkeys will get will not be lethal. They will live out their natural lives of about 20 years. The radiation dose is to determine CNS change and be able to diagnose Alzheimer's and the beginnings stages of dementia. This study is to determine whether or not there will be changes to the central nervous system.

Member Mannhaupt asked if the dose given to them is the same as the astronauts get.

Schneider said the estimated dose will be given proportionately to their size. This is a test to see if there is damage done.

8. Community Comment

Several members of the community spoke during this portion of the meeting. Reed thanked them for their comments.

The comments are attached at the end of the notes.

9. NASA Research Proposal Discussion cont.

Member Anker asked what happens to these animals if they develop health issues.

Schneider said there is no expectation that the monkeys will be need to be euthanized. They will be treated for any medical illness that they might have.

Member Guthy asked if they will be in pain. Will they be segregated? Have these monkeys always been together so far? How have they been raised and how will it be different than what they had before?

Cucinotta said the monkeys have not been purchased yet. There are about a dozen organized NIH primate centers that raise monkeys for research purposes. They will be about 3 years old when they are purchased, but since the study has not been funded, we don't know their history yet.

Member Shea stated that humanoids visiting earth might think of us as lower life forms, much as we view the spider monkeys. They might use us for research experiments.

Schneider said that he hopes that people that we might meet outside of planet Earth would be friendly, but this is outside his realm. He also responded to the question (see Community Comments) regarding worms and cell tissues. He said that these have been used previously for radiation experiments.

Cucinotta added that worms have been used with heavy ion exposure and human tissue cultures have been used. There have been studies proving that Aliens would not be able to come to Earth because the doses of space radiation would be too high.

Member Shea responded to Dr. Cucinotta's remarks about Aliens not being able to come to Earth because of the high doses of space radiation by describing a daylight UFO experience she had in high school in Northern Ohio over 50 years ago witnessed by her and two teams of girls playing field hockey.

Member Jordan-Sweet asked if astronauts that have been in low Earth orbit have been studied.

Schneider said the dose is low in terms of radiation and it's a very small number so you can't tell whether or not it's the radiation or other things that are causing problems. As astronauts and others get older, changes are seen in brain function, but to be able to know the specific cause controlled studies of one kind or another would have to be done. We are hopeful that we can get a solid answer based on real data.

Member Mannhaupt said, in summary, NASA put out proposals, Bergman answered that proposal and in his proposal he had squirrel monkeys. You guys liked it, so it went down the chain of command and BNL got caught in the middle because they can irradiate these monkeys that will give you the information on their CNS that might be extrapolated to humans so we can apply it to the astronauts in the coming years. Is that all correct?

Cucinotta said that's a good summary, but there are many steps that are left out.

Schneider said I don't see it that way. Congress asked NASA and DOE to work together and that's why we have the NASA Space Radiation Laboratory on the Brookhaven site. The purpose of that was to be able to study the effect of high energy radiation on astronauts and how we can safely have them explore the universe. This was National policy and continues to be. We are trying to use the facilities that are available using the best techniques possible. Brookhaven veterinary staff and animal husbandry are known to be one of the best so when we have studies that we want to do here, we are dependent upon the Brookhaven IACUC to understand and be able to read the protocol and ask the right questions of the Principle Investigator so they make

an educated and expert judgment. I believe they have done that. I don't see this as we have hoodwinked the Brookhaven IACUC or that we have held Brookhaven hostage to a National policy that they don't want to participate in. This is part and parcel of the National discussions that we have all the time on what science is important and how we get that science done.

Member Mannhaupt said she understands that NASA and DOE have a working relationship. No one has more respect for the work that this facility does. With all due respect I understand what you are saying, but the fact of the matter is that Brookhaven Lab wants a recommendation from the CAC. These groups came to us in good faith and presented information to us and asked us to consider their position. We have to digest all the information. I thank you very much for responding to our call so we can do that with all due respect to BNL.

Member Esposito said she would like to close the Q&A session. We have heard all this information and we need to now consider making a recommendation.

Reed thanked the NASA representatives.

Member Schwartz thanked all the guests for expressing their views.

Reed asked if the CAC would like to make a recommendation tonight or if they would like to limit the agenda for next month and deliberate on this issue and SPDES.

Member Esposito asked if they had another month to do this.

Reed said yes, if it is needed.

Member Mannhaupt suggested that deliberation on this issue be limited to 30 minutes, because there are two water issues to discuss next month.

Member Esposito asked what those two issues were.

D'Ascoli said the other issue is the Peconic, but it can wait until July.

The meeting adjourned at 9:52 p.m.

				Jan	Feb (cancelled)	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
P = Present	2010	Affiliation	First Name	Last Name											
ABCO	(Garber added on 4/10/02)	Member	Don	Garber	P		P	P	P						
ABCO		Alternate													
Brookhaven Retired Employees Association (Peskin replaced Campbell 09/09)		Member	Arnie	Peskin			P	P	P						
Brookhaven Retired Employees Association (L. Jacobson new alternate as of 4/99)(A. Peskin 5/04)(Franz 12/09)		Alternate	Eena-Mai	Franz				P	P						
CHEC (Community Health & Environment Coalition (added 10/04)		Member	Sarah	Anker	P		P	P	P						
(added 12/08) (R. Andrejkovics removed 9/09)		Alternate													
Citizens Campaign for the Environment		Member	Adrienne	Esposito	P		P	P	P						
Citizens Campaign for the Environment (Ottney added 4/02-taken off 1/05 Mahoney put on)(7/06 add Kasey Jacobs)(K. Jacobs off 1/08)		Alternate													
Colonial Woods Whispering Pines (added 06/09)		Member	Christine	Birben	P		P	P	P						
Colonial Woods Whispering Pines (added 09/09)		Alternate	Joan	Milner											
E. Yaphank Civic Association		Member	Michael	Giacomaro	P		P	P	P						
E. Yaphank Civic Association (J. Minasi new alternate as of 3/99) (M. Triber 11/05) (Munson 6/06) (Feinman 2/09)		Alternate	Bob	Feinman	P		P	P	P						
Educator (changed 7/2006)(Bush member 5/10)		Member	Greg	Bush			P	P	P						
Educator (B. Martin - 9/01)		Alternate	Bruce	Martin											
Educator (A. Martin new alternate 2/00) (Adam to college 8/01)(add. alternate 9/02) (changed 7/2006)(Bush 5/09)		Alternate	Adam	Martin											
Fire Rescue and Emergency Services		Member	Joe	Williams				P							
Fire Rescue and Emergency Services		Alternate	Don	Lynch											
Fire Rescue and Emergency Services		Alternate	James	McLoughlin											
Friends of Brookhaven (E.Kaplan changed to become member 7/1/01)		Member	Ed	Kaplan			P								
Friends of Brookhaven (E.Kaplan changed to become member 7/1/01)(Schwartz added 11/18/02)		Alternate	Steve	Schwartz					P						
Health Care		Member	Jane	Corrarino											
Health Care		Alternate													
Huntington Breast Cancer Coalition		Member	Mary Joan	Shea			P	P	P						
Huntington Breast Cancer Coalition		Alternate	Scott	Carlin											
Intl. Brotherhood of Electrical Workers/Local 2230 (S.Krsnak replaced M. Walker 1/11/07)		Member	Scott	Krsnak				P	P						

P = Present	2010	Affiliation	First Name	Last Name	Jan	Feb (cancelled)	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
		IBEW/Local 2230	Alternate	Philip	Pizzo											
		L.I. Pine Barrens Society	Member	Richard	Amper	P										
		L.I. Pine Barrens Society (added P. Loris 6/05)(Alayeva off 6/08) (Itriyeva 02/09) (Motschenbacher 6/09)	Alternate	Beth	Motschenbacher			P	P	P						
		L.I. Pine Barrens Society	Alternate	Susie	Husted											
		L.I. Progressive Coalition	Member	David	Sprintzen	P			P	P						
		L.I. Progressive Coalition	Alternate	None	None											
		Lake Panamoka Civic Association (Biss as of 4/02)	Member	Rita	Biss	P		P	P	P						
		Lake Panamoka Civic Association (Rita Biss new alternate as of 3/99) (Gibbons off 1/10)	Alternate													
		Long Island Association (Groneman replace 10/05)	Member													
		Long Island Association	Alternate	William	Evanzia											
		Longwood Alliance	Member	Tom	Talbot	P		P	P	P						
		Longwood Alliance	Alternate	Kevin	Crowley											
		Longwood Central School Dist. (switched 11/02)(Castro replaced Henigin 6/09)	Member	Maria	Castro	P		P	P	P						
		Longwood Central School Dist.	Alternate	Allan	Gerstenlauer											
		NEAR	Member	Jean	Mannhaupt			P	P	P						
		NEAR (prospect taken off ¾) (Blumer added 10/04)	Alternate	Karen	Blumer			P								
		NSLS User	Member	Jean	Jordan-Sweet	P			P	P						
		NSLS User	Alternate	Peter	Stephens											
		Ridge Civic Association	Member	Pat	Henagan	P		P	P							
		Science & Technology (added 1/13/05)	Member	Iqbal	Chaudhry			P	P	P						
		Town of Brookhaven (Graves made member 6/06)	Member	Anthony	Graves	P		P	P	P						
		Town of Brookhaven	Alternate	None	None											
		Town of Brookhaven, Senior Citizens	Member	James	Heil	P		P	P							
		Town of Brookhaven, Senior Citizens (open slot as of 4/99)	Alternate													
		Town of Riverhead	Member													
		Town of Riverhead (K. Skinner alternate as of 4/99)	Alternate	Kim	Skinner											
		Wading River Civic Association	Member	Helga	Guthy	P		P	P	P						
		Wading River Civic Association	Alternate	Sid	Bail											

Community Comments

The following comments were written on 5X8 index cards by members of the community:

Anonymous – If there are no evident scientific facts to continue with these experiments on squirrel monkeys as opposed to alternative solutions, I do not see it as a point to carry forward on future experiments.

Anonymous – Proverbs 12:10 (New King James Bible) “A righteous man regards the life of his animal, but even the tender mercies of the wicked are cruel”. We are answerable to God’s authority over all creation. Thank you.

Geri Borrusso – Repetitive experiments on animals is no help. No progress gets made. Animals and man have different systems so prove nothing. Animals should live a comfortable existence before/during any experimental procedures. Animals should only be used for a small amount of time and be released from “duty” in a humane way (as children’s work laws protect them, we should protect the animals also). They have hearts and emotions just as we do.

James Borrusso – Experience has shown animal experimentation has provided very little useful information and should not be endorsed by any government agency. Manned space travel is both expensive and dangerous, mostly useful to front page headlines. The accomplishments of manned space travel could be more safely and economically performed by machines.

Elaine Cappelletti – Animal experimentation vs. human experimentation. If you want to know and understand the effects on humans – not monkeys – why not use human volunteers in the research. Especially someone on death row (ex. murder) who could be given some type of bonus for this, let’s say “payback” to society.

Katherine & William Cerny – NASA People (Brookhaven Lab) you cannot be serious. NASA has plans to travel to Mars. You have already polluted and harmed Earth. I would be more interested as to your plans (serious plans) to clean up this planet. How can you improve the oil that is, as I write this, spewing in the Gulf of Mexico? Do you have any idea how much damages have been to Earth and you giddily speak of moving on to Mars. As far as “ethical treatment” for monkeys, look at your reflection in your mirror and try to spew that fertilizer to yourself. Ethical assessment?

Bonita Grandal – I would like to register my opposition to the use of non-human primates in NASA’s experiments of galactic cosmic rays, solar particle events, and high energy protons/heavy ions with respect to incidence of cancer, central nervous system risks and other effects on astronauts. We have seen time and time again that non-human experiments rarely transfer truly usable data to humans. It appears obvious that irradiation of any sort is damaging to the cell. We already have this information. Deep space radiation will likely be as damaging and therefore it seems to me monies are best spent in development of alloys that would provide adequate shielding materials (which can most likely be tested w/o live subjects). I also wonder if there are biological organisms like algae, fungus, and bacteria which could be protective. After all, yeasts and fungi are often present and protective to humans who have concentrations of heavy metals in the body. What about looking into prophylactic measures that may make the organism resistant to GCR & HZE? How about testing on cells and tissues grown in the lab? The use of primates is not in the best interest of this science. It is a move backward at a time when we must move to a more enlightened state. The final comment that there may be potential benefit for U.S. citizens (slide #17) who work with radiation – well – are we planning to bring intergalactic cosmic radiation

into our hospitals and power plants? Let's move out of the stone age of the animal model and into the new age of quantum physics – with benefits from homeopathy, energy therapies and forward thinking/designed experiments. Thank you.

Gina Lozada – I strongly disagree with animal testing. It is cruel. Research should be done on humans. They should use inmates convicted through DNA testing on death row.

Paula Lozada – Stop cruelty to animals. Animal research is very cruel. Use terrorists instead. They should have no rights.

Donna McGinness – I would like to express my concerns regarding the NASA Radiation research using animals. Besides the ethical aspects of animal experiments, my true concern is that their results may not apply to humans due to major physiological differences between the species. Besides species differences, stress is another factor. The laboratory environment is one of constant and inherent stress. Animals start out being shipped as freight and end up in the chronic confinement of a laboratory. They are unable to move freely, unable to get away from their own wastes and at intervals are taken from their cages for instrumentation, blood tests, surgery, weighing, or whatever else is on the laboratory schedule. These effects are routine for the laboratory staff, but can be terrifying for animals. When animals are stressed their immune functions, hormone levels, cancer rates, and susceptibility to viral and bacterial infections all change. Stressed animals frequently exhibit illnesses of various kinds, leaving experimenters to try to sort out which symptoms are caused by the radiation and which are caused by lab conditions or other unknown factors. With new studies and breakthroughs in the medical industry; studies show that tests using human cells, human tissues, case studies and sophisticated computer technologies are more accurate than animal tests. If our goal is a better understanding of human illness, it is my strong opinion that there is no substitute for human population studies and clinical research of human data in searching for the causes of human disease.

Claude Pragliola – Please do not do this to any animal! The research may be important, yes, but there is a moral guideline related to God and the universe. (Scientific Illuminism). I believe this research can be done without this portion of it. You would gain more support for your research by showing your compassion for life! I understand the overall for the good of man, but please find another way to do this. Thank you.

MaryAnn Ruis – I am a PETA member and have a deep concern for the welfare of animals. This cruel experiment by NASA involving radiation to helpless monkeys is highly unethical and inhumane. I understand these monkeys will spend their entire life isolated in cages with future problems of cancer, blindness, and brain disorders. Man has made great advancements in various technologies. With this, is man willing to freely reduce himself to the tortures he has inflicted similar to medieval times? There must be other means available to study scientific problems.

Darlene Scharfschwerdt – I urge the Director of the Brookhaven Laboratory to end the testing on animals. It is not necessary to perform these tests on squirrel monkeys for NASA. It is not respect for life. I do not want my taxes that I pay to go toward this. Thank you. I am missing my 7 year olds baseball game to be here to help the monkeys.

Lorraine Silvestro – I urge the Director of the Lab to end any consideration of performing radiation testing on squirrel monkeys for NASA. This experiment is unnecessary, inhumane, and it goes against the ethical code of NASA. The monkeys will be inflicted with immense pain and suffering which goes against NASA's statement that "Living creatures deserve respect" and "other methods should be used when possible". There is no "societal benefit" of this experiment. People will not benefit from space travel. We have

other urgent issues, such as, green energy, environmental preservation, and social and economic justice. Also, we do not know if the effects on monkeys will be the same as the effects of radiation on humans. NASA's ethical code also includes "Non-maleficence", which is a "minimization of distress, pain, and suffering is a moral imperative" Isolating monkeys who are social, intelligent animals and inflicting them with radiation is extremely cruel and it causes severe suffering. Have we not learned anything from the chimpanzees who were subjected to cruel experiments and isolated in metal cages? I will be voting for politicians who are against funding for NASA and Brookhaven Lab if this experiment is conducted.

Theresa – I grew up on Sound Avenue in Riverhead and we now own a home in Wading River for the past 10 years. I am here tonight because I believe that "Monkeys Matter". I believe that monkeys feel pain, feel love, feel fear, and know kindness. I know they are innocent. I do not understand how anyone can harm them.

The following people made verbal comments to the CAC:

Michael Burke - I am a lifelong citizen of this area and I am dedicated to cruelty free lifestyle. I was horrified when I heard this was going to happen here. My dad was a truck driver who hauled radioactive material out of here many years ago, so I have a fond spot for this place. It is horrifying to hear that this will go on here and that I will pass by and know what happened here. I am hoping this will not take place. I want to keep my comments brief. This was a purely emotionally reaction to get up here and say something because I cannot look away or be silent on it. Thank you.

Sue Hanson - I am here because I received a recorded phone message from PETA asking me to attend. I have three questions. First of all, how many monkeys are we talking about? Thirty, ok. This is an RFP that has already been awarded to BNL. Is that correct?

Member Esposito explained that this is not BNL's RFP; it is an individual scientist's RFP who would utilize BNL for one portion of the work.

Hanson: Has it already been awarded to BNL? Is it a done deal?

Reed: No it's not a done deal.

Hanson: Who ultimately makes the decision whether this will go forward or not?

Several people responded that the Director of the Laboratory is expected to make the decision.

Sheldon Penn – I am a geologist and I was a professor at Suffolk Community College. I have been engaged in various kinds of research all of my life and it just doesn't seem right that you are ready to go to higher life forms like monkeys and other kinds of primates before I have heard anything about worms or tissue that's not part of a living animal, but might once have been and see what effect this has on them. I think worms are quite common and there are many things that we share with worms, but I don't really know enough about them.

Yvonne Crabitz – I am a concerned citizen and a member of PETA. Are astronauts that have been in space more prone to cancer than the general population? If you are so concerned about the safety of astronauts in deep space, then let the astronauts know the risks so they can make informed decisions. Torturing monkeys is not the answer. Monkeys are like babies, it makes me want to cry to think what these innocents will be subjected to. Not only spending their lives in cages, but the pain, isolation, and captivity that they will have to endure. And for what reason? Seems to me it's all about grants, jobs, and senseless research projects that are dreamed up. I am not much of an activist. I am a mother and a grandmother, but in this case I forced myself to be here tonight. We already know the effects of radiation. Please stop the cruelty. Monkeys are our genetic cousins. Animals have a central nervous system as we do. They feel pain as we do. This research is not acceptable, it is totally unacceptable. Low dose radiation is given to people who have cancer, do they then suffer from Alzheimer's? Wouldn't that be more useful to find out rather than subjecting monkeys to low dose radiation? Thank you.

Ian Smith, PETA - (Taken from written statement) Tracing the timeline of events that has occurred in this case, it is difficult to believe that this project ever underwent a rigorous review to determine either its scientific merit or ethical acceptability. Rather, it seems that this project was destined for approval from its very inception with NASA providing the funds before the relevant committees—such as Brookhaven's animal experimentation oversight committee—ever had a chance to seriously evaluate the project.

On October 27, 2009, NASA announced on its website they would be funding Jack Bergman's proposal for radiation experiments on up to 30 squirrel monkeys at a cost of nearly \$2 million.

The NASA guidelines for the grant very clearly stated that approval from the animal experimentation oversight committees at the facilities where the project would take place, “must be received no later than 90 days after the proposal due date,” which was June 25, 2009. This means that to comply with the guidelines, Bergman should have secured approval for the project from Brookhaven and Harvard's McLean Hospital by September 25, 2009. NASA's grant guidelines state that, “Proposals that do not conform to the standards outlined...will be declared noncompliant and declined without review.”

Additionally, Federal Regulations governing the use of animals in studies funded by NASA state that “Before a proposal for research involving the use of animal subjects will be considered for NASA support, NASA... must receive a statement that the research has been...approved by the appropriate [animal experimentation oversight committee] at the participating institution.” However, approval for Bergman's project was not obtained by the September 25 deadline set by NASA or before funding was announced by NASA. In violation of federal guidelines and laws, NASA appears to have green-lighted the project and committed funding even before it had undergone an ethical and scientific review from BNL, one of the facilities where it would actually be conducted.

In fact, on December 2, 2009, the Brookhaven National Laboratory (BNL) issued a statement indicating that they “[had] not yet received the NASA proposal” and that it had yet to be approved by the required committees. At this time, according to NASA's own guidelines and federal law, this project should have been disqualified from consideration, but it wasn't. NASA's only response to our concerns about this issue has basically been that we are right but that they always violate their guidelines and the law.

In January 2010, the BNL animal experimentation oversight committee finally granted its *conditional* approval for the use of squirrel monkeys in Bergman's proposed radiation experiment.

However, the committee did so without having been provided—as is required by law—with any information regarding the potential harm the project would cause the monkeys in the experiment such as malignant tumors, brain damage, skin damage, blindness, premature aging, and premature death. Bergman even suggested that “the planned studies do not involve pain” which is contrary to both common sense and the available scientific literature. The committee was also not provided with any information about how or if the study was relevant to human astronauts or about the decades of previous space radiation studies on monkeys that have already been conducted, and found to be inapplicable to humans.

With the lack of information that was provided to the committee by Jack Bergman, it would be literally impossible to properly evaluate the scientific and ethical merits of the experiment and, it is unclear how or why BNL granted even its *conditional* approval in the absence of the most fundamental information about the project. While some of this information may have been subsequently provided to the committee after complaints from PETA and other groups, it was clear that the committee already has its biases in favor of the project.

The integrity of the review process is called into question if committee members are aware that substantial funding has already been awarded to the project and that it is only their approval which is needed for a project to commence or if committee members are not given adequate information on the potential harm to animal subjects or the lack of success in similar experiments that have been previously conducted.

NASA's failure to adhere to its own grant rules, Bergman's failure to meet the relevant deadlines and BNL's initial failure to adequately review the project and its hasty approval are not simply clerical matters. These processes serve an important function by insuring that research projects being considered for funding from taxpayers receive a rigorous ethical and scientific review and that they constitute a judicious use of federal funds, which this project decidedly does not.

Noah Gittell, PCRM – I would like to pass around several letters from presidents of primate sanctuaries here in America. Several have agreed to take the squirrel monkeys if we can end these experiments and convince McLean to release them. I know there has been some question about what's going to happen to these monkeys if we stop this. The first one will take all of them. A couple others can take a few of them if something else happens. If you look at the dates on these letters, they are dated in June because if you make the recommendation that these experiments should not continue and if management listens and vetoes these experiments, the next thing we are doing is going to McLean and asking them to release these monkeys to these sanctuaries. I want to say when you think about the ethics of animal experimentation, we weigh the pros and the cons, the benefits and the detriments. Here are the benefits for this experiment, \$27,000 for BNL, NASA claims there is a medical and scientific benefit to this but PCRM has provided you with ample evidence that this is not the case. The detriments are great suffering, isolation, possibly even death for the animals involved, damage to the reputation of this institution, and increased scrutiny for future projects. I want to be clear that this is not a recommendation you are making for all animal research for all time. This is a recommendation based on this one protocol. I take issue with a few things that Dr. Cucinotti and Dr. Schneider said, but I don't have time to do that. If anyone has questions, I would love to discuss those things further. For right now, when I think about whether an experiment is right to do or not, I imagine a pet of mine. I want you to take a moment to think about an animal that you have been close to, a family dog, cat, or a childhood pet. I want you to think about what would happen if they were in this experiment instead of the monkeys. Think about them housed by themselves in an animal facility in Massachusetts, put into a truck and brought to Brookhaven, put into solitary housing again here at Brookhaven, put into a tiny cage and dosed with heavy ionizing radiation, then put back into a truck, sent back to a facility in Massachusetts, where it will only be taken out of its cage for the next four years to press levers, be put in a restraining chair, or push

buttons. That's for the next four years and possibly even longer, as you heard, if this study is renewed. I want you to think about that animal and ask yourself, is this worth it. We don't think it is. I would love to take any questions; I know we don't have a lot of time.

Rafaela Floccomio – (Taken from written statement) As we know, radiation is harmful and such research won't help to protect humans. There are no potential findings between humans and monkeys. Their brain structure and development are different from humans. Other researchers concluded that monkeys are poor models for the effects of radiation on humans. A group of physicians announced plans to block this proposal, of supercharged space radiation on 2 pound monkeys in which NASA will be using BNL in this experiment. Of the 12 grants approved on deep space travel on [the] human body, BNL will be the only one using squirrel monkeys. NASA is planning to ignore history and repeat its mistakes with this experiment, which was proven and failed. NASA already knows that cosmic radiation can cause cancers, severe or lethal brain damage, serious illness and death. A 2 pound monkey is not going to give them any different answer, of what they already know. Modern technology is available, software models and human phantoms equipped with radiation sensors. Both methods have shown to be better than monkey radiation. Any data obtained from the 24 astronauts who [have] already flown beyond low earth orbit will be more useful than monkeys. Aside from their dubious value, this proposed experiment also violates fundamental criteria for ethical research. Dr. John Pippin, senior medical advisor for the Physicians Committee called this experiment "nonsense" and it is bad science; bad ethics and an ill advised funding (Newsday Dec. 4, pg. A31). These squirrel monkeys are very sociable and live in groups of 500. They will be caged for several years and will be restrained in a chair 5 days a week and given doses of harsh cosmic radiation. As a cancer patient myself with minimized radiation, 5 days a week for 8 weeks, I had a lot of setbacks, was very sick, [and] some of my skin came off. At least I had a voice to tell the doctors during the 8 weeks how sick I felt, and what I was feeling in my body. These 2 pound monkeys have no voices. This experiment is ill funded, has scant human benefit, it's inhumane, and [not] the least bit applicable to human space travel.

Elizabeth Clark – I am a local citizen and I want to ask you all to please not do this. When you go to sleep at night, can you sleep at night having something like this go through? It just hurts and I think the number of people who have shown up tonight goes to show that. How can you go to sleep at night knowing that these little monkeys will be tortured for the rest of their lives? It's not worth it.