



Illinois Dunesland Preservation Society

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June 12, 2007

Formal Complaint and Request **By Email**

Stephen Johnson, USEPA Administrator, Washington, D.C.

Mary Gade, Administrator, USEPA Region V, Chicago

Steven Rothblatt, USEPA Director Air Enforcement and Radiation, Region V

George Czerniak, USEPA Branch Chief Air Enforcement and Radiation, Region V

Brent Marable, USEPA Section Chief Air Enforcement and Radiation, Region V

Bell Roderick, USEPA Acting Inspector General USEPA, Washington, D.C. (#2007-374)

RE: Region V USEPA's Limited Superfund Comments on Exposure Investigation Report by ATSDR/CDC (Asbestos Illinois Shoreline) Do Not Fully Represent the Agency; Region V Creates New Libby East

- Request that USEPA's National Staff Review the Mishandling of the Asbestos Superfund site and the Release of Asbestos Fibers on the Illinois Shoreline
- Request that Region V's All Relevant Division and Section Staff that were Excluded Review and Make Comments to ATSDR/CDC
- Region V USEPA's Exclusionary Comments on Superfund Should Not Speak for the Entire Region's Position on ATSDR/CDC's Flawed and "Rigged" Exposure Investigation Report
- Region V Ignores NESHAPS Complaints, Obstructing Enforcement and Compliance
- Region V USEPA Staff Excluded from Receiving ATSDR/CDC Illinois Shoreline Asbestos Report; Superfund Division Secretly Makes Comments on Non-Superfund Sites While Other Non-Superfund Staff is Excluded from the Review Process
- Request All Relevant Staff from All Sections or Divisions at Region V that were Excluded from the Internal Review Process be Allowed to Review and Comment on the ATSDR/CDC Draft Report and that Superfund Not Manage or Control This Review Process
- Region V Repeatedly Ignore NESHAPS Asbestos Violations Made by State and Other Polluters, Willfully Obstruction Enforcement and Compliance.
- Millions of Citizens Unwittingly Exposed to Deadly Amphibole Asbestos on the Illinois Shoreline While Region V Officials Knowingly Allowed Violations and Non-Compliance
- Region V's Incompetence and Mismanagement of the Asbestos Superfund Site on the Illinois Shoreline has Fostered the Systematic Spread of Deadly Amphibole Fibers, Exposing Millions Who Visit the Illinois Shoreline and Beaches

The week of May 28, I spoke with George Czerniak, USEPA Branch Chief Air Enforcement and Radiation, Region V about the asbestos issues on the Illinois shoreline, related NESHAPS, and the willful lack of enforcement by USEPA Region V. As we discussed the asbestos issues, it became apparent that Mr. Czerniak was unaware of the ATSDR/CDC draft Exposure Investigation Report on which Superfund had exclusively made comments and he didn't know about Superfund's solo attempt to make comments, excluding input from other Region V staff.

I was astonished to discover that only the Superfund division was making limited comments on this report, creating the perception that those comments were speaking for the entire Region V. It appears that Brad Bradley, program manager for the Johns Manville Superfund site, and attorney Jan Carlson, with the input of a toxicologist, were involved in transmitting these brief comments to ATSDR/CDC. Superfund's solo comments appear to have significant overlapping outside its area of expertise and JURISDICTION since these comments were not about a Superfund sites. Without Air and Radiation and other divisions and sections of EPA, the apparent void creates a deficit in scientific review. Mr. Bradley's comments had some valid points and limited accurate statements, but they were severely limited. They missed making many other significant comments that others within the agency could have made. This created an appearance to the public that USEPA's comments are from the totality of USEPA Region V. Obviously, that is not correct. These comments come from a very narrow, biased, skewed perspective and are not of the collective staff within Region V that has jurisdiction and/or expertise in this area.

It is unfortunate that other relevant divisions and departments did not have the opportunity to read the attached report with the agency's comments and make their own comments. I am also attaching an ethics complaint filed against the draft reports author by our asbestos expert Jeffery C. Camplin. Other EPA agencies need to evaluate the report and the ATSDR draft report from their perspective. The ATSDR report also includes misstatements on evidence that was gathered to apparently mislead enforcement agencies and officials. It also had apparent input from IDPH which has authorship in other flawed asbestos reports and in this case has discredited itself from being a valid co-author because of its biased interest in covering-up their previous flawed reports. Superfund personnel identified some of these attempts. However, other EPA officials with enforcement authority might interpret the ATSDR findings as evidence of regulatory violations.

The fact that Superfund division alone is making comments creates a narrowly interpreted point of view with an obviously impractical agenda. Mr. Bradley's enthusiasm and agenda as a long-time manager for the Johns Manville Superfund site, with his goal on delisting the site, has created a skewed imbalance in proper professional review. Mr. Bradley is not an expert in risk assessments and the science pertaining to it, although the public and ATSDR are led to believe that the comments from Mr. Bradley represent all of Region V.

An example is that Mr. Bradley called me to look at two asbestos sites at Illinois Beach State Park due to some of our complaints and related newspaper articles. He visited Camp Logan with me and the beach adjacent to the contaminated feeder beach in 2006 shortly after the first illegal burning of the asbestos-contaminated area by IDNR. I asked him why he was here since they weren't Superfund sites. He said he came out on his own. When I asked him if other departments in Region V were aware he was coming out, he said they weren't but he would report his findings to the Great Lakes program. That was additionally puzzling.

The ATSDR draft report identifies:

1. The presence of manufactured asbestos debris and demolition debris including transite piping.
2. A false claim by the Illinois Department of Natural Resources that most debris originated from several hundred homes that previously washed into Lake Michigan. In fact, the IDNR's own recent research in 2006 found no evidence of transite piping used in these homes. Yet, transite piping, manufactured at the JM plant, now a Superfund site, have chronically appeared on the beaches for decades. No comment from USEPA Superfund on this misleading effort by the ATSDR report to put blame on residential homes instead of JM.
3. The report documents the chronic nature of this pollution
4. The report provides verification of elevated airborne emissions of asbestos, including amphiboles.

Region 5 USEPA Superfund is attempting to distract all involved from JM pollution as a major source of microscopic asbestos, including the most toxic amphiboles, that has spread to Illinois Beach State Park. They are "handling" this non-Superfund issue for Region 5. Region 5 Superfund attempts to appear critical of the ATSDR draft study, yet will support the fraudulent findings that the asbestos debris is not from JM, but from several hundred "mystery" homes that washed into the lake. In fact, very few homes washed into the lake; most were demolished for marina construction or landfilled onsite to open up land acquired by IDNR. The asbestos is regulated waste from JM or from demolition of hundreds of homes. An investigation is warranted into why unsubstantiated and misleading "sources" of chronic asbestos contamination are allowed to be accepted. The unsubstantiated sources conveniently lead us away from the true sources and responsible parties. It is clear that the attempt to fraudulently identify misleading sources is used to obstruct enforcement and downplay the chronic health hazards posed by the presence of this regulated pollution by responsible parties (including IDNR who funded the study and supplied the bogus information on hundreds of homes washing into the lake).

A regulatory and criminal investigation is warranted into ATSDR and the Illinois Department of Natural Resources. The ATSDR draft completely mischaracterizes these findings as "safe." Region V Superfund identified some of the more obvious flaws and misleading statements being made. Others in EPA need to also make comments and look into the improprieties in statements made by ATSDR. Consider that many unsubstantiated "facts" in this polluter-financed study are also being supplied by these same polluters/regulators. Mr. Bradley failed to acknowledge this important finding.

We request that you review and investigate Brad Bradley's and Jan Carlson's activities in this matter and the reasons why this ATSDR/CDC draft has been kept from other divisions/departments in the region to review and have input. The ATSDR/CDC report that was commented on is fatally flawed and rigged. Additionally, we request that Region V seek outside, written review comments from headquarters or other regions. Superfund's attempt to be exclusionary is due to its own agenda to downplay visible and microscopic asbestos contamination on the Illinois shoreline in any way, shape, or form.

We will be making our own expert comments to you so Region V can consider our well supported observations since the entire process has been conducted in secret and the learned environmental community has been kept from making valuable comments or participating in any meaningful way, despite our many offers and requests to do so. Our exclusion in this process was allowed by Region V contrary to ATSDR/CDC's policy of requiring the inclusion of the public in the process. As stakeholders, we certainly should have been part of the process all along. Again, we request that all of Region V's expertise be included in the review of this document and that the review be sent in a timely manner to ATSDR/CDC. Hopefully, USEPA headquarters will supply their own experts to review the entire Superfund, the potential to make the beaches and Camp Logan new Superfund sites, and a thorough by other asbestos risk assessment professionals.

We look forward to your response and your review of our comments.

Sincerely,

Paul A. Kakuris

Paul A. Kakuris, President

Attachments:

1. April 24, 2007, Letter from Brad Bradley, USEPA Superfund Manager to Mark Johnson, ATSDR/CDC
2. June 26, 2006, Ethics Complaint about ATSDR Staff from Jeffery C. Camplin to ATSDR/CDC
3. Spring, 2007, USEPA Exposure Investigation Report prepared by James T. Durant

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604**

April 24, 2007

Mark Johnson
Agency for Toxic Substances and Disease Registry
77 West Jackson Blvd (4th Floor)
Chicago, Illinois 60604

Dear Mr. Johnson:

Thank you for the opportunity to review the draft "Exposure Investigation Report" (the Report) for the Illinois Beach State Park. The U.S. Environmental Protection Agency (EPA) has the following comments concerning the Report:

- 1) The dates and time of day and weather conditions (temperature, wind speed and direction, dew point) for each of the activity-based sampling events should be provided in the text of the Report.
- 2) The date and time of the last measurable precipitation prior to each of the sampling events should be included in the text of the Report.
- 3) If not already stated, the height at which the personnel monitors were located (e.g. 4 feet off the ground) should be noted in the text of the Report.

For comments 1-3, any potential biases introduced by the conditions present at the time of monitoring should be noted in the text.

4) How do the activity-based sampling locations comport with the previous sand sampling results from the June 6, 2005 UIC Interim Report? In other words, were there activity-based sampling locations located in the immediate vicinity of the samples with the highest asbestos fiber counts (i.e. sampling locations ISBP-15S, ISBP-16S, ISBP-17A, ISBP-18A, ISBP-20A, ISBP-21A, and ISBP-22A)? It is not easy for EPA to determine this since the maps included in EPA's copy of the UIC Interim Report are hard to interpret and do not include sampling locations ISBP-17A through ISBP-22A.

5) Discussion of the implications of the fact that the some of the activity-based air results exceed the benchmarks set in the aftermath of the World Trade Center disaster should be included in the report.

6) In the first paragraph on page 11, is it now known how much, what type and how often you have to be exposed to asbestos fibers to develop mesothelioma?

7) The paragraph on page 12, which states that "Based on the bulk analysis of sand samples collected, the sand in of itself does not appear to pose a significant source of asbestos fibers" is a little misleading. The air samples near the beach grading equipment were significantly elevated; therefore, this would indicate that there might be a problem with this statement.

8) The last paragraph on page 12, regarding the use of the Berman & Crump Methodology for conducting risk assessments at asbestos sites is confusing, did they use it on IBSP and ATSDR is not recommending its use now

since it has not been approved by the US EPA or what is the story? A lot of text is devoted to discussing the Berman & Crump method throughout the text and in the References but if it is still not approved why bother since the risk can not be calculated the way it is proposed?

9) Under Limitations and Uncertainties the indented paragraph on page 13 is suspect. Either you can do a risk assessment properly or say you can not do it now and since pieces of asbestos and asbestos fibers were found on the beach it is questionable to call it safe or without risk.

10) Recommendation #2, Page 14- EPA feels strongly that warning signs should include photographs of commonly-encountered ACM and a clearly-posted contact number to call if any such materials are identified or suspected by park visitors.

11) Recommendation #3, Page 14- EPA cannot comment on this recommendation until the information requested in the preceding comments is provided.

12) Recommendation #4, Page 14- EPA feels strongly that beach grading activities should be conducted only under damp conditions as it is not always possible to determine whether or not persons will be present during such activities. Proper protective equipment should be worn by workers engaged in grading activities.

13) Regarding the human health safety statements in the Report, the Executive Summary states that it is within the acceptable risk range under certain conditions to use the IBSP beaches for the general public BUT for maintenance activities they should be conducted when sand surface is wet or closed to the public. It is also stated that the IDNR should continue asbestos removal from the beach. These inconsistencies and the actual air monitoring results raise concerns regarding the safety of human use of the beaches. There is ACM on the beach and it should be removed, the maintenance workers should take precautions but it is OK for the public and especially children to play with and on the beach. What is going on here, either the beach is safe or the safety is questionable.

EPA proposes that the TRW asbestos work group or other experts ask and answer the following questions: If a child plays with a friable asbestos chunk (one where fibers can be released by handling) on the IBSP beach, which would be an acute exposure scenario, will the child have minimal risk or a lot? And can we consider the beach safe?

These comments are those of the EPA Region 5 staff. Additional comments may be forwarded to you in the future. If you have any questions concerning this letter, please contact me at (312) 886-4742.

Sincerely,

Brad Bradley
Remedial Project Manager

cc: Sandy Bron, Illinois EPA
Beth Wallace, Illinois AG
Stan Yonkausk, IDNR

Jeffery C. Camplin, CSP
1681 Verde Lane, Mundelein, IL 60060

1-708-284-4563
Fax: 1-847-837-1852

June 26, 2006

ETHICS COMPLAINT ABOUT ATSDR STAFF

Centers for Disease Control and Prevention
Mail Stop D-14
Atlanta GA 30329-4018

Via E-mail

Attention: Michael O. Leavitt, Secretary of the U.S. Department of Health and Human Services
Howard Frumkin, MD, DrPH, ATSDR Director
Julie Louise Gerberding, M.D., M.P.H., Director of CDC, Administrator of ATSDR

RE: ATSDR Exposes Public During Rigged Asbestos Activity-Based Testing at Illinois Beach State Park
ATSDR Staff and Exposure Investigation Team Leader James Durant Supervise Inappropriate Tests
Independent Investigation Demanded to End Unethical Skewing of Public Asbestos Exposure Risks

Dear Secretary Leavitt, Dr. Frumkin, and Dr. Gerberding:

I am requesting an investigation into the unethical, inappropriate, unprofessional, and careless actions of your ATSDR staff, which resulted in uncontrolled asbestos exposures to unwitting citizens during an activity-based asbestos evaluation at Illinois Beach State Park in May 2006. I am specifically requesting an independent investigation into the unethical behavior of ATSDR Exposure Investigation Team leader James Durant and ATSDR Chicago staffers, who personally supervised and approved activity-based testing protocol that placed the public at risk from asbestos exposure during sampling conducted during the week of May 22, 2006.

Top ATSDR Administrators' Mismanagement Facilitates Staffs' Culture of Elitism and Abuse of Power

I have complained to your agency for nearly a year about misconduct and unprofessional behavior by ATSDR/CDC/HHS and your Illinois partners involved in covering up massive asbestos contamination along the Illinois Lake Michigan shoreline. Many of my complaints have been addressed directly to Dr. Gerberding who has allowed compromised staffers to pen boilerplate non-responses to very serious charges of your staff's behavior. Your agency has willfully delayed properly responding to these charges by providing non-responses or by taking unreasonable extensions to avoid responding to me.

Unfortunately for you, your delays in acting upon my complaints have allowed my warnings of your staff's predicted motivations and actions to come to fruition. I am attaching a small sampling of my previous complaints and warnings to you regarding ATSDR and its Illinois partners' inappropriate behavior regarding their involvement with asbestos contamination at Illinois Beach State Park in Zion, Illinois. Your lack of staff supervision has resulted in egregious misconduct and ethical violations by your agency and its Illinois partners. **Please take immediate actions to properly investigate and thoroughly respond to the charges found in this letter and my previous correspondence.**

ATSDR Supervises Tests that Expose Illinois Families to Asbestos During Secretly Skewed Study

ATSDR staff from the Atlanta and Chicago offices was present while men, women and children were exposed to asbestos fibers during recent activity-based asbestos testing designed to measure airborne asbestos exposure on public beaches. The unprotected public was allowed to enter the testing areas while the worker performing the exposure sampling was warned of the hazards of asbestos and protected during the event by wearing a respirator. The unethical and irresponsible actions conducted under ATSDR staff supervision involved a small

bulldozer dragging a section of chain link fence while air monitoring devices measured asbestos fibers being released from the asbestos-contaminated beach sand on the main public beach at Illinois Beach State Park.

Members of the public were not notified of the testing, which was designed to generate dust and fibers in areas populated with innocent families. The bulldozer and dust-generating chain link fencing operation was performed within a few feet of the unaware families. This thoughtless act demonstrates a pattern of careless and unethical behavior by ATSDR and its Illinois partners that have resulted in asbestos exposures that would have been prevented if diligent actions had been taken. The Illinois partners included in this activity-based testing (as well as other failed attempts to determine public safety of the asbestos-contaminated shoreline) include the Illinois Department of Public Health, Illinois Department of Natural Resources, University of Illinois-Chicago, Illinois Attorney General's Office, Illinois EPA, ATSDR-Chicago Office, USEPA Region 5, and an array of well paid consultants. It now appears that ATSDR and many of its Illinois partners have determined "in advance" that there is no need to warn or protect the public from unknown health hazards presented from the chronic asbestos contamination that is found along the Illinois Lake Michigan shoreline. ATSDR staff should know better and set a proper example. Mr. Durant has let your agency down by apparently concluding no airborne asbestos hazards existed before the asbestos testing was performed, samples were analyzed, or a risk assessment on this data was conducted.

Evidence of ATSDR/CDC Staff Misconduct Grows Without Any Formal Management Response

I have complained to your agency on multiple occasions (see attached letters) regarding the inappropriate and unethical conduct of ATSDR/CDC staff and its Illinois partners involved in covering-up chronic asbestos contamination and public exposures at Illinois Beach State Park. In July 2005 I challenged the validity of a scientifically unsupported public health assessment (PHA) conducted by ATSDR in 2000. I appealed an embarrassing non-response provided by CDC's Chief Science Officer Dr. Dixie Schneider in December 2005. I am still waiting for a proper response from your agency to my July 2005 request for information correction.

I have also asked to be involved with the secret activity-based asbestos exposure testing that was conducted in May 2006 at Illinois Beach State Park. I was provided with a copy of ATSDR's vague, activity-based plan a few days before testing was to take place. ATSDR and its Illinois partners developed this study in secrecy over an eight-month period while battling requests from the Illinois Dunesland Preservation Society and me to review the protocols and provide comments prior to starting the testing. On a tight deadline of two days, I was able to provide a quick response to the obvious problems I noted upon review of the plan in a May 19, 2006 letter sent to your Chief of Staff.

I asked that ATSDR delay the study until more representative dry conditions were present later in the summer. I also asked to meet with ATSDR to discuss my concerns (copy of May 19, 2006 letter attached) prior to the testing. A month has passed and I have not received any response from ATSDR or CDC. In fact, the activity-based asbestos exposure testing proceeded just a few days after Illinois experienced nine straight days of rain and only one day above 70° F during the previous two weeks in May. Not surprisingly, I also discovered that ATSDR and its Illinois partners strayed from the plan provided to us when modifications were made in the field during the testing.

I have many outstanding complaints into your office regarding this activity-based testing. When can I expect a response and an offer to meet and end this public health charade being perpetrated by ATSDR and its Illinois partners?

Sloppy ATSDR Testing Uncovered and Documented with Video and Photographic Evidence

ATSDR/CDC and its Illinois partners have repeatedly denied requests for public involvement and oversight of the planned activity-based asbestos testing that was conducted in May 2006 at Illinois Beach State Park. This secret study was conducted in public areas of the park's beaches while families were present. I performed surveillance on the beaches for several days until I observed this activity-based testing taking place. I was able

to take video and photographs of ATSDR staff supervising activities that endangered the public. The video and photos reveal several apparent environmental, safety and public health violations perpetrated by ATSDR/CDC staff and its Illinois partners. The video incredibly depicts families being used as human guinea pigs while asbestos-contaminated sands were disturbed by heavy machinery during the careless testing that was designed, approved, and supervised by ATSDR's James Durant and its Chicago staffers.

Unprotected ATSDR Staff Caught Drinking Soda in Regulated Asbestos Testing Area

This first picture below is a frame from video that was taken in the early evening of May 23, 2006. Recognize anyone? Note one individual is holding a bottle of soda in the testing area.



The second picture on the previous page places ATSDR staff, its Illinois partners, and their consultant standing in the test area without any personal protection. The worker in the bulldozer performing the asbestos activity-based testing is wearing respiratory protection while your staff takes pictures, drinks soda, and socializes. Is this appropriate conduct for ATSDR project supervisors performing testing in a public area?

There are no warning signs or physical barriers preventing unauthorized individuals from entering the regulated testing area. Note that the worker in the bulldozer disturbing the asbestos-contaminated sand in the picture above is wearing proper respiratory protection as required by worker safety regulations. The beach should have been closed to the public and unauthorized or unprotected workers (including ATSDR staff) should not have been allowed near the test vehicle during the activity-based testing. Why did Mr. Durant and other agency officials allow these sloppy, uncaring, and unprofessional work practices to take place? Why weren't these simple precautionary steps taken to protect workers and the public from unknown airborne asbestos exposures?

Skewed Activity Testing Minimizes Sampling Devices Ability to Capture Airborne Asbestos Fibers

The picture below is a close-up of the air testing equipment used to allegedly measure airborne asbestos fibers that could be released during beach maintenance and grooming activities conducted by park staff. This picture demonstrates that air testing equipment was placed too high above a majority of the dust that was generated by simulating the beach maintenance and grooming activity. The air-sampling cassette was also turned facing towards the back, which clearly will minimize the study's potential to capture any airborne asbestos fibers, which by chance, might be able to reach the elevated testing equipment. This strategy of aiming air testing cassettes away from the dust-generating activity was not specified in the vague study plans provided by Mr. Durant, so I was not able to provide any advance comments on this flawed test method.



However, my photos and video have uncovered the many gaps in the vague testing protocol developed by ATSDR and its Illinois partners. Now I can provide more accurate and specific comments with first-hand knowledge of the flawed and skewed work product being produced by your staff and its Illinois partners. ATSDR staff supervised and apparently approved the inappropriate placement of the testing devices used in the airborne asbestos evaluation. They were certainly close enough to the testing equipment, as illustrated in

several of my photos, to observe and comment on their placement. The test devices should be further back from the dragging chain link fence and much lower to the ground if the goal of the test is to trap airborne asbestos fibers. The air testing cassettes should also be facing the dust generating activity instead of facing away. No one would be standing on the back of this maintenance equipment. Why was the air testing measured there? Wouldn't it have been more appropriate to place air monitoring devices on your staffers who were exposed during the study?

There was a very brisk wind present during the testing that appeared to push dusts away from the testing device as the vehicle faced north, east and west. When the bulldozer was facing south (into the wind), dust and fibers would be expected to blow right past the testing devices at a velocity too fast to be captured and measured by the inappropriately placed testing equipment. It appears from the video evidence that ATSDR/CDC staff supervised and approved the placement of the air testing devices and the publicly accessible area in which the testing would occur in.

ATSDR/CDC Staff Inexplicably Allows Unwarned Families to be Exposed in Asbestos Test Areas

ATSDR/CDC and its Illinois partners were more concerned about public perceptions than public protection during their skewed activity-based asbestos testing. Workers who were visible to the public did not wear respirators even though no proper OSHA asbestos negative exposure assessments were conducted that would indicate whether respiratory protection was necessary. No warning signs or barriers were present to educate unsuspecting families about the potential asbestos exposures in the test areas. Although workers were educated about the risks from asbestos and offered respiratory protection, this same information and protection was not provided to unaware families. This is a willful violation of safety and health standards by State of Illinois and ATSDR/CDC staff. Why was the public allowed to be exposed to asbestos by your testing?



Note in the picture above that an unprotected citizen is walking along the shoreline in the background while the activity-based asbestos testing is taking place. This was an unnecessary exposure to an individual who is clearly unaware of what is in the cloud of dust he is inhaling. Signage and barriers could have easily been placed along the shoreline to warn the public that this portion of the beach was temporarily closed. Instead, ATSDR/CDC and its Illinois partners apparently decided that the study could only remain "secret" if no one wore visible personal protection, warning signs and barriers were not constructed, and the public had full and

unrestricted access during the testing event. ATSDR/CDC staff did not wear protective equipment and did not prevent a citizen from entering the testing area where simulated maintenance activities were disturbing asbestos-contaminated beach sands. However, the unethical behavior of your staff continued to emerge as families ventured into the testing zone without any warning or directions to leave the beach testing area.

ATSDR/CDC Refuse to Warn Families/Public While Test Designed to Disturb Asbestos Takes Place

The following photos are frames from a several minute video I took that documented egregious violations of common precautionary measures almost always taken at sites by CDC/ATSDR when potential asbestos exposures are being measured and evaluated.



Unfortunately, ATSDR staff appears to be more concerned about keeping the study secret than they are about warning unprotected members of the public of potential exposures to asbestos during the activity-based testing. Note that the worker in the vehicle is wearing a respirator as required by worker protection regulations. An uninformed public does not even have the chance to avoid the vehicle as it churns up dust from the asbestos-contaminated beach.





In the above picture, a member of the public bends down to pick up a shell, a rock, or possibly a weathered piece of asbestos debris that is commonly found in this area while the other person observes. The testing equipment is dragged within a few feet of their position. Why weren't these innocent bystanders warned of the potential asbestos hazards and asked to leave the immediate area prior to the activity-based testing that is designed to generate airborne dusts? The inappropriate and unethical behavior exhibited by ATSDR/CDC staff must be investigated and promptly corrected. ATSDR staffer James Durant (who supervised and approved this testing in publicly accessible areas) along with other ATSDR staffers and their Illinois partners, should be held accountable and disciplined for his egregious lack of care for public health.



The second picture on the previous page depicts the windy and cold conditions under which ATSDR/CDC's activity-based asbestos testing operated. As the testing continues, part of the ATSDR/CDC/Illinois partners "testing observation group" walks back to their cars with the belief that their skewed testing will deliver the negative airborne asbestos results they seek. Note that wind gusts are so brisk that one of the test observers must hold onto her hat as her jacket is kicked up by the stiff, cold breeze. The testing performed on a cool, windy day after more than a week of rain is hardly representative of a hot summer day in July or August. Also, note the soda bottle in the right hand of the test observer to the right. Worker protection regulations prohibit eating, drinking and smoking in regulated asbestos areas where asbestos exposure is unknown. The ATSDR/CDC staff members appeared quite proud of themselves thinking they had successfully hidden the activity-based asbestos exposure testing from beachgoers, even if it was at the expense of a few members of the public.

ATSDR Claims the Presence of Water is "Not Critical" in Inhibiting Airborne Asbestos in Study



The picture above was published in the May 25, 2006 edition of the *Waukegan News Sun* newspaper. It shows an unprotected worker disturbing wet asbestos-contaminated sands near the Lake Michigan shoreline. The unprotected worker is wearing a heavy coat due to the cool, damp conditions found at the testing site. A newspaper reporter asked one of ATSDR's Illinois partners to comment on the wet, cold conditions of the beach. Pat Giordano from the Illinois Department of Natural Resources (the Agency that runs Illinois Beach State Park) provided quite an exaggerated description of the skewed activity-based testing being performed by ATSDR and his agency. Mr. Giordano was quoted in the newspaper as saying

Giordano of the IDNR said he was out at the park Tuesday when testing was going on and he said the sand was dry as a bone. "It was blowing all over the place, you feel like you are getting sand blasted," he said, adding that there were three dry days.

Unfortunately for Mr. Giordano, my pictures and video along with those of the media portray a cold, damp environment that does not resemble summertime beach activities. Why would ATSDR's Illinois partner at the Illinois Department of Natural Resources attempt to mischaracterize the poor testing conditions found during the weeklong tests? Does anyone really believe that conditions resembled anything close to sand-blasting conditions? Mr. Giordano's statement was disingenuous and apparently meant to deceive the media and the public about the true conditions found during the skewed testing. However, ATSDR was present and had the opportunity to set the record straight regarding the wet conditions found during testing.

ATSDR's James Durant was also asked by the media to comment on charges that the sand was too wet to simulate airborne asbestos exposures during summertime beach activities being conducted by children. Mr. Durant was quoted in the newspaper as stating:

James Durant, an environmental health scientist with the Agency for Toxic Substances and Disease Registry, which is a branch of the federal Centers for Disease Control and Prevention, was in the area to observe and helped develop the protocol used for testing.

He disagreed that it was too wet for testing. The tests didn't begin until after there was over 48 hours of no precipitation as measured at Waukegan Regional Airport. Durant also said that there is another aspect of the issue.

"The size of the asbestos fibers we were dealing with is not wettable by water," he said, explaining that during asbestos removals, water is amended to reduce the surface tension so it adheres to the fiber." So water is not a critical role," he added.

Is Mr. Durant speaking on behalf of ATSDR when he makes such a statement to the media? Does ATSDR agree with Mr. Durant's position that asbestos fibers bound in sand are not wettable by water? Is it ATSDR's position that simulated children's activities on cold, wet sand will generate the same airborne exposure to asbestos fibers performed on hot, dry sand? This unsupported, willfully deceptive, and misleading statement further illustrates the extent to which ATSDR staff and its Illinois partners will go in order to cover-up the flawed science utilized in a sham study designed to underestimate airborne asbestos exposures to the public.

Mr. Durant then has the nerve to follow-up this incredible quote above with another revealing and incriminating statement:

"We're not here to cover anything up," he said, "and we're not an alarmist agency."

Source: May 25, 2006 Waukegan News Sun (www.suburbanchicagonews.com/newssun/top/5_1_wa25_asbestosbeach_s1.htm)

Apparently, Mr. Durant believed that he was being an "alarmist" if he informed the public of the asbestos air testing being performed or took basic precautionary steps preventing unprotected access into the testing area. What is truly alarming is the conduct of ATSDR staff and that of its Illinois partners.

Air Testing Results will Remain Secret until ATSDR Crafts a Biased Evaluation to Rig Final Report

ATSDR/CDC and its Illinois partners worked on the design of the activity-based testing protocol at Illinois Beach State Park in secrecy for approximately eight months. Your agency repeatedly ignored the public's request to participate in this process. There is no logical reason why members of the public were unknowingly allowed into the testing areas to become inadvertent participants in the activity-based asbestos exposure monitoring when knowledgeable members of the public were prohibited from participating. ATSDR/CDC staff must be held accountable for their careless, unethical, and unprofessional actions that allowed families to wander into areas that should have been isolated from the public. However, it appears that ATSDR/CDC and its Illinois Partners have cleverly colluded to withhold testing results from the public until your agency evaluates the laboratory data by a yet-to-be determined risk modeling methodology.

The consultant for the Illinois Department of Natural Resources specifically is omitting the sample results from their report to you. They will simply discuss sampling and analytical methodologies while excluding the laboratory data or any interpretations of them. The results will be secretly provided to your agency as a "draft," where they will remain void of public scrutiny in the State of Illinois. If we dare ask ATSDR for copies of the air testing results we will be redirected, of course, to the Illinois Department of Natural Resources, which will pretend the lab results are draft and therefore cannot be released to the public. Why would ATSDR handle lab test results that should clearly be in the consultant's report? I am very suspicious

about this abnormal handling of sample results that have already been analyzed, but withheld from the public. It appears that Mr. Durant wants to control analytical data and risk modeling selection so that the preconceived conclusions that the beaches are “safe” can be manipulated into fruition.

Mr. Durant’s apparent unethical behavior has tarnished the credibility of your agency. The public is losing trust in your agency’s ability to objectively evaluate the chronic asbestos issues that have plagued the Illinois Lake Michigan shoreline for decades.

- Will you end the secrecy and open this asbestos evaluation process up to the public in an honest and transparent manner?
- Will your agency end the collusion with your Illinois partners that ensures the testing data would remain secret until your final report could be suspiciously prepared?
- Will you break the secrecy involved with the unethical behavior of your staff and allow the laboratory results you will be reviewing to be available to the public immediately upon request?
- Will you also investigate why Mr. Durant was allowed to withhold his revelation of the selection of a risk model to evaluate the lab samples until sampling results are reviewed? Page 7 of Mr. Durant’s study design states, “The appropriate risk model used will be determined by the mineralogy and length of the asbestos structures in the samples.” Is it appropriate to get results first and then select a method to evaluate them? Shouldn’t an appropriate risk model be determined at the onset of the study to minimize the appearance of bias by your staff?
- When will the public learn about the risk model Mr. Durant selects for his evaluation?
- Will the public have an opportunity to review the lab results and provide comment to ATSDR on what risk model is appropriate from our perspective PRIOR to ATSDR’s and Mr. Durant’s (post-testing) handpicked health risk model selection?
- Will ATSDR staff honor my request to meet and discuss more appropriate activity-based testing protocols that should be performed more accurately in the hot, dry, summer months or will you continue to skew the testing and risk modeling protocol?
- Will Health and Human Services ever honestly answer my “Request for Information Correction” of your 2000 PHA (which I challenged in July 2005) and end the chronic non-responses and delays?

Although in my opinion, the activity-based testing was skewed by Mr. Durant to minimize airborne asbestos that could be measured; my pictures and video clearly show the public at risk. **I demand an independent investigation into this complaint and my other previous charges of ATSDR/CDC staff misconduct and unethical behavior. This investigation must be conducted in a manner that is open and transparent to the public. ATSDR/CDC and its Illinois partners must also make a good faith effort to notify the public along with those family members who were present and potentially exposed to airborne asbestos during any and all activity-based asbestos testing at Illinois Beach State Park.**

I will make my incriminating video available to the independent investigators who will handle this complaint. Thank you for your prompt attention into investigating potential public harms created by the reckless and unethical behavior of ATSDR and CDC staff members.

Cordially,

Jeffery C. Camplin, CSP, CPEA

c: Daniel R. Levinson, Office of Inspector General, Department of Health and Human Services
Lisa Madigan, Illinois Attorney General’s Office
Douglas P. Scott, Director, Illinois EPA
Sam Flood, Director, Illinois Department of Natural Resources
Eric E. Whitaker, M.D., Director, Illinois Department of Public Health
Dale Galassie, Director, Lake County Health Department
Paul A Kakuris, President, Illinois Dunesland Preservation Society
Alison Young, Nancy Albritton, Atlanta Journal

ATTACHMENTS

Previous Letters Submitted to ATSDR/CDC/HHS Regarding Staff Misconduct

February 7, 2006

March 13, 2006

April 17, 2006

May 19, 2006

Jeffery C. Camplin, CSP
1681 Verde Lane, Mundelein, IL 60060

1-708-284-4563
Fax: 1-847-837-1852

Centers for Disease Control and Prevention
Management Analysis and Services Office
1600 Clifton Road, N.E., Mailstop E-11
Atlanta, Georgia 30333

February 7, 2006

Attention: Request for Information Correction Appeal Officer

Regarding: CDC/ATSDR Staff Misconduct
Request for Information Correction Appeal Follow-up
Camplin Appeal of Dixie E. Snider, Jr., M.D., M.P.H Response Letter
Illinois Beach State Park PHA of June 2000

Dear Sirs:

I submitted an appeal to you regarding the December 6, 2006 response signed by Dixie E. Snider, Jr., M.D., M.P.H., Chief Science Officer of CDC to my request for information correction. I believe it is necessary to follow-up this appeal to head off further misconduct by Region 5 ATSDR and CDC Atlanta personnel in their attempts to continue to protect their Illinois partners: the University of Illinois at Chicago School of Public Health and the Illinois Department of Public Health.

I admonished and criticized Dr. Snider for blindly signing off on the December 6, 2005 response letter to my July 28, 2005 request for correction of the June, 2000 PHA for Illinois Beach State Park. Since I submitted my December 22, 2005 appeal with ATSDR, I have discovered that, in fact, this letter was apparently authored with the assistance of ATSDR Associate Administrator for Federal Programs, Dr. Mark M. Bashor in cooperation with your Illinois partners at the Illinois Department of Public Health. What is more disturbing is that the draft work product was apparently reviewed by Labretta Lanier-Gholoston, Management and Program Analyst whose office I submitted my appeal to. The HSS policy clearly states that those who authored the initial December 6, 2005 response to me will not be involved in responding to my appeal request. This appears to be a gross violation of Agency policy and an obvious conflict of interest if Ms. Lanier-Gholoston or Dr. Bashor is involved in responding to my appeal. If this is true, is ATSDR/CDC organizational compliance of their agency policies that corrupt? Where is the internal oversight of your agency staff? I am asking the office of the inspector general to look into this apparent misconduct and violation of agency policy and the agencies role in a potential cover-up of past inappropriate behavior.

Now I have been recently informed through the Illinois Department of Natural Resources that Region 5 ATSDR (apparently at the direction of CDC in Atlanta), is assisting the Illinois Department of Public Health, University of Illinois-Chicago, PSI Consultants, Brad Bradley of USEPA Region 5, Illinois EPA, and the Illinois Department of Natural Resources with conducting activity-based asbestos risk assessments at Illinois Beach State Park. The reality and deception is that this organized, exclusive group is operating in a clandestine manner, excluding the public from what should be an open and transparent process. Your agency is currently participating in a group that has historically gone out of its way to exclude the public or avoid performing their work in an open and transparent manner while actively spending taxpayer resources. This is contrary to your

ATSDR/CDC policies for conducting risk studies and casts doubt on the scientific integrity of this secret group, including your agency. This would now be the fourth time ATSDR has tried to help its Illinois Partners cover-up the massive asbestos contamination they are responsible for accelerating along the Illinois Lake Michigan shoreline. I, therefore, must act preemptively and bring light to current and anticipated future actions by your Agency and staff. This apparent cover-up must cease.

First, it appears that my appeal will be conveniently deferred another 60 to 90 days to allow your ATSDR Region 5 and headquarters staff to further assist your Illinois partners in a unwise attempt to save face with the scientific manipulation and blunders conducted by their 2000 PHA and the recently released June, 2005 Interim UIC report. If you are contemplating further stall tactic by requesting additional time to review my appeal, I will not accept it. As a Safety and Health professional, I will consider any delay as an act of scientific fraud in an attempt to perpetrated a last ditch effort to cover-up potentially criminal acts by ATSDR and your Illinois partners that put the citizens of Illinois at further risk from tremolite asbestos. My July 28, 2005 request for correction and my December 22, 2005 appeal have provided enough information and time for even the most junior of staff members in ATSDR and CDC to make a proper and timely response. I assume a timely response will not be difficult for your agency to provide since your Chief Science Officer chose to initially respond to my original request. Anything less than a timely response to my appeal would be a bold move on the part of ATSDR and CDC to obstruct due process requiring further investigation into the motives of what appears to be such a shameful and transparent act. However, I request per your agency policy that those CDC staff members and the Illinois partners involved in ghost writing and reviewing the December 6, 2005 response for Dr. Snider, not have anything to do with reviewing or responding to my December 22, 2005 appeal.

Second, my original request of correction has nothing to do with the June, 2005 UIC interim report or the planned activity-based asbestos risk assessment scheduled for this spring at Illinois Beach State Park. Citing these ongoing studies as a reason not to respond to my appeal in a timely manner is an obviously deceptive move aimed to avoid a proper and timely response. This was already attempted in Dr. Bashor's apparent ATSDR authored response that was blindly signed off by Chief Science Officer Dixie Snider. I have succinctly articulated multiple reasons to ATSDR and CDC in my appeal for labeling the 2000 PHA as "no longer valid as a public health assessment." My appeal left no doubt that the 2000 PHA has no relationship to any other study and is no longer valid based on current asbestos risk protocols. There are no other legitimate excuses or delay tactics left in defense of the now-outdated June, 2000 PHA for Illinois Beach State Park. Respond to my appeal in a timely manner. Again, do not delay a response to my appeal.

Third, since ATSDR is compelled by some unknown force to remain actively involved in these covert activities, I request that you require your Illinois partners and ATSDR's Region 5 office to open up their closed and secretive activity based asbestos risk assessment process planned for this spring at Illinois Beach State Park. The secrecy and unscientific approaches previously used to hide the massive tremolite and other microscopic asbestos contamination from the Illinois-Wisconsin border down to the shores of Oak Street beach in Chicago must end. The Chicago Park District recently performed secret activity-based asbestos air tests last summer to claim the Chicago beaches were safe from asbestos accidentally found by your partially funded June, 2005 UIC interim report. Was it a coincidence that one of the major sources of past and current asbestos releases into Lake Michigan (Johns-Manville) currently uses the same consultant that performed the Chicago Park District's

activity-based asbestos study? How can the public have confidence in a secret report conducted in Chicago with such an apparent conflict of interest? Why won't the Chicago Park District publicly release this secret study conducted by Johns-Manville's Superfund site asbestos consultant (the polluter) for taxpayers to review? Yet your Illinois partners quote these surreptitious studies as science-based fact that support the beaches are safe from asbestos hazards for adults and children. You need to pay more attention to the motives, activities, and claims made by your Illinois partners regarding tremolite and other microscopic asbestos contamination along the Illinois Lake Michigan shoreline.

Finally, there is not enough scientifically valid testing of the Illinois Lake Michigan shoreline to properly characterize what areas are actually contaminated with tremolite and other microscopic asbestos fibers. The shoreline is a dynamic process, constantly changing based upon weather and seasons. A limited set of sampling data generated by a state of Illinois sponsored secret asbestos task force can hardly be definitive in determining where activity based risk studies should be conducted. The limited number of beach samples, the use of extensive compositing protocols, and significant issues with internal analytical laboratory quality control, require the use of more detailed sampling and analytical protocols to properly characterize the extent of tremolite and other microscopic asbestos contamination in shoreline sands. Your agency must demand additional, transparent, lakefront sampling using proper protocols and with public involvement, prior to overseeing any activity-based risk assessments. Otherwise, your agency's integrity will fall further by endorsing the use of this "junk science" in the interim June, 2005 UIC report, that ATSDR refuses to peer review. The fatal flaws of the sampling and analytical protocols found in the interim June, 2005 UIC report would have been easily identified by your agency as a significant problem nearly 6 months ago had ATSDR agreed to perform a scientific peer review of this limited document when you were asked to by UIC back in June 2005. Why is this non-peer reviewed, scientifically flawed document being propped up by your agency and used as a basis for the future activity-based risk assessment that is planned for this spring? Shouldn't you peer review it first?

ATSDR and CDC tout that risk assessments should be conducted in an open and transparent manner inviting its most contemptuous challengers into the process. Your website states:

Recognize the importance of community input. Citizen involvement is important because (a) people are entitled to make decisions about issues that directly affect their lives; (b) input from the community can help the agency make better decisions; (c) involvement in the process leads to greater understanding of - and more appropriate reaction to - a particular risk; (d) those who are affected by a problem bring different variables to the problem-solving equation; and (e) cooperation increases credibility. Finally, battles that erode public confidence and agency resources are more likely when community input isn't sought or considered.

I won't give you the indignity of quoting all of the points about public involvement in open and transparent risk assessments found on your website. It is clear your agencies, staff and funding is involved in the secretly conducted asbestos activities along the Illinois Lake Michigan shoreline. You have a responsibility to require this process to be conducted with public involvement, in an open and transparent manner. Once this fourth attempt to downplay asbestos risks to Illinois citizens is completed, a legitimate scientific peer review must be conducted by your agency of all past and current alleged risk-based testing and studies. This is necessary to sort out the facts (if any) from the fiction behind your Illinois partner's claims that there are no apparent asbestos hazards along the Illinois Lake Michigan shoreline.

If ATSDR/CDC is not actively and willfully involved in the apparent efforts to cover-up asbestos hazards in these reports on the Illinois shoreline, then they have been duped by their Illinois partners. Either way, your agency needs to take immediate actions to protect its scientific integrity and ethics. It is obvious that ATSDR/CDC has been deficient in properly verifying or attempting a meaningful vetting of this process because the results are a tragic betrayal of the public by your agency. Illinois citizens have endured the incompetence of your Illinois partners and now deserve integrity and science to be brought into evaluating a serious public health emergency of microscopic tremolite asbestos on the Illinois Lake Michigan shorelines. The unprofessional conduct and actions of ATSDR/CDC and its Illinois partners are creating the perception of the Illinois beaches turning into a "Libby east," both in the health threats to citizens and indictments of those who fail to act on their knowledge of these hazards.

I look forward to a timely response to my December 22, 2005 appeal letter and an invitation to participate in the development of the protocols for the activity-based risk assessment being conducted at Illinois Beach State Park this spring. Please copy me on your correspondence with your Illinois partners in response to my requests.

Cordially,

Jeffery C. Camplin

Jeffery C. Camplin, CSP, CPEA

c: Office of Inspector General, Department of Health and Human Services
Michael O. Leavitt, Secretary of the U.S. Department of Health and Human Services
Julie L. Gerberding, MD, MPH, CDC Director and ATSDR Administrator
Howard Frumkin, MD, DrPH, ATSDR Director
Dixie E. Snider, Jr., M.D., M.P.H., CDC/ATSDR Chief Science Officer
Drue Barrett, PhD, Acting Associate Director, ATSDR Office of Science
Mark Johnson, ATSDR Region 5
Dr. Mark Bashor, Associate Administrator for Federal Programs
Labretta Lanier-Gholoston,

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March 13, 2006

Centers for Disease Control and Prevention
Office of the Director
1600 Clifton Road, N.E., Mailstop D-14
Atlanta, Georgia 30333

To: Julie Louise Gerberding, M.D., M.P.H.
Director of CDC, Administrator of ATSDR

Re: **●HHS Refuses to Correct Flawed PHA Ignoring Tremolite Asbestos at Public Beaches**
●ATSDR Administrator's Cold Response Ignores Serious Charges of Staff Misconduct
●CDC Head Covers-up Fact that Staff Knowingly Ignores Response Deadline to Appeal
●Conflict of Interest Charge and Appeal Process Policy Violation Not Addressed
●Request for Open and Transparent Asbestos Studies at Illinois Beach Disregarded
●ATSDR Ignores Charges of Collusion with Illinois Partners in Flawed 2000 PHA
●Asbestos Expert Accuses ATSDR of Cover-up – Administrator Provides no Response
●ATSDR Ignores Millions of Citizen's Exposure to Asbestos Including Tremolite
●ATSDR, CDC, and HHS Cover-up Compared to Indicted Officials in Libby, Montana

Dear Dr. Gerberding,

I have received your evasive, inadequate response which is really a non- response and bureaucratic boilerplate, dated February 23, 2006, to the serious charges made in my February 7, 2006 letter to your agency. I wrote the February 23, 2006 letter (copying the Secretary of HHS and the Director of CDC) as a preemptive charge that ATSDR was in collusion with your state of Illinois partners to delay a proper and timely response to my December 2005 appeal in order to cover up incompetence and errors. The December, 2005 appeal was in response to an ethically and scientifically bankrupt denial of my July, 2005 request for correction for the very outdated 2000 Public Health Assessment (PHA) which used inadequate risk analysis that created a fraudulent document of public asbestos exposures at Illinois Beach State Park in Zion, Illinois. The initial denial of my request by CDC Chief Science officer Dixie Schneider refused to address the correction requested in my July 26, 2005 information quality challenge. No one at ATSDR, CDC, or HHS has ever responded to my July, 2005 request to add a disclaimer to your flawed non-risk based 2000 Public Health Assessment (PHA) that states it is no longer valid based upon current risk-based knowledge.

My February 7, 2006 letter to you accurately predicted that your agency would continue to stall a proper response to my original, unanswered, July 2005 information request. In the February 23, 2006 response letter that you signed, it claimed "My understanding is that a response to your appeal is in development and we anticipate it will be finalized by the required 60-day period." However, two days prior to you signing this generic statement I received a response from your staff (as I had predicted in my February 7 letter to you) stating an additional 60 days would be necessary, beyond the initial 60-days, to respond to my appeal.

How can you claim, as you do in your recent form letter, that "The Centers of Disease Control and Prevention and the Agency for Toxic Substances and Disease Registry (ATSDR) takes all information quality complaints

seriously” when in actuality, they haven’t?” It is apparent that in your response, your staff used you by further misstating the facts in order to further cover-up their own incompetence. Do you also take charges of staff misconduct and misbehavior seriously as well? Dr. Gerberding, actions speak louder than words. I have accused your agency of conspiring to cover-up mistakes made by your agency and your Illinois partners (Illinois Department of Public Health, University of Illinois at Chicago School of Public Health) in evaluating the public health risks from asbestos-contamination (including tremolite) at public beaches along the Illinois Lake Michigan shoreline. Your sole response to these grave charges is an inaccurate, evasive, boilerplate, non-response letter that refuses to address serious charges of HHS staff misconduct including violation of agency policies in responding to my appeal. I demand that you do more than just sign a non-personal, boilerplate response letter that is robotically generated by your clerical staff. I expect you to actually investigate my charges and respond back to me with answers. Unfortunately, to date, you have remained silent on charges of staff misconduct which manifests into millions of Illinois citizens being unwittingly exposed to microscopic asbestos, including tremolite.

By ignoring these charges, your approach appears to be arrogant, detached, and evasive; it is a blatant attempt to put HHS staff above policy or the law. You are government employees who are accountable to citizens to follow established protocols and investigate charges of misconduct by your staff. I will continue to demand that you and HHS staff play by the rules and seek scientific truth. Your response letter shows that you are uninterested and/or unaware of the inappropriate actions of your staff. How can you claim that a timely response to my appeal is being worked on when your staff already had sent out a letter to me indicating they had failed to meet your agency’s required 60-day response deadline? Let me remind you that I made this request on July 26, 2005; it is now March 13, 2006. You said they were finalizing my appeal response when all they were preparing was another 60 day stall. How hard is it for your office staff to make a simple phone call and check the facts for you before asking you to blindly put your name on an inaccurate boilerplate response to a concerned citizen? Or, were you actually aware that they were preparing another 60 day staff letter when you signed your letter to me? Your failure to properly acknowledge, investigate and respond to the serious charges of misconduct by HHS staff makes you, along with Dr. Frumkin, and Secretary Leavitt, facilitators of this misconduct and inappropriate behavior of your staff and their Illinois partners. I asked for answers from you, not an evasive boilerplate response concocted by your underlings. Is my assumption right that you were not part of this scheme?

Let there be no confusion of the charges I am making against ATSDR, CDC, and HHS staff and the answers I seek from YOU:

1. No one at HHS has ever responded to the sole request in my July 26, 2005 request for correction of an invalid 2000 PHA for asbestos at Illinois Beach State Park. It took nearly 5 months to get a bogus and unsupported denial response from your Chief Science Officer. You failed to answer why my initial request was never answered in your agencies denial response. When can I expect a proper answer to my July 26, 2005 request for correction?
2. I quickly, accurately, and severely criticized and discredited the thoughtless and evasive response by your Chief Science Officer, Dr. Schneider, with a mountain of facts in a December 2005 appeal of your agencies denial of my July, 2005 request for correction. I had the feeling HHS would have a significant problem addressing the eye-opening charges found in my appeal and wrote a preemptive letter in February 7, 2006 that anticipated another 60-day delay by your staff. I asked that you not delay your response to my appeal due to the potential public health emergency regarding tremolite and other asbestos-contamination on the Illinois Lake Michigan shoreline. I also outlined misconduct by your staff due to the fact that you allowed the same individuals involved with preparing your extremely flawed initial response that denied my July 2005 request to my December 2005 appeal. Your staff failed to address this charge in the form letter they had you sign. Will you now answer this charge of policy violations in the handling of my appeal response?
3. I charged ATSDR Region 5 and their Illinois partners with covering-up their apparent bungling of a very flawed 2000 PHA and subsequent interim asbestos report by the University of Illinois at Chicago,

School of Public Health which used that document to support their very flawed interim report. (Let us all be reminded that ATSDR subsequently reviewed that UIC document informally and found the UIC document to contain significant flaws.). You failed to respond to this serious charge regarding HHS staff behavior and the secrecy and flaws contained in these CDC/ATSDR funded projects. Will you address my charges of a cover-up by your staff and your Illinois partners regarding asbestos-contamination at Illinois Beach State Park?

4. I found out that Region 5 ATSDR is informally assisting the Illinois Department of Natural Resources with a secret activity-based asbestos study scheduled for this spring at Illinois Beach State Park. I stated in my letter to you that HHS would probably delay a response to my appeal so that this secret asbestos study could be completed. It is my opinion that you and your Illinois partners hope this secretly conducted activity-based asbestos study will somehow save you all from the embarrassing reality that your past PHA claims about the safety of Illinois beaches from asbestos-contamination is fraudulent. I know better and so do you. I asked that you compel the IDNR through Region 5 ATSDR to open up this secret activity-based asbestos study your agency has offered to assist at Illinois Beach State Park. You and your Illinois partners have strayed away from science and are too eager to quote outdated and secretive non-peer reviewed documents to make unsupported public health claims from asbestos-contamination at Illinois Beach State Park. This is in direct opposition to your agencies' policies of transparency. Will you officially ask IDNR in writing that this study should be conducted in an open and transparent manner with public involvement? Will you also ask that this information undergo peer review before it is cited?
5. Your Chief Science Officer cited a fatally flawed UIC interim asbestos study as a defense that your outdated 2000 PHA was still valid. However, by ATSDR's own admission, there were significant problems with the UIC interim report; in essence the data did not support UIC's conclusions. I stated in my letter that your agency refused to perform an official peer review of this document even though ASTDR and CDC partially funded it. Will you officially peer review this interim UIC report that is cited by you and your Illinois partners in support of fraudulent claims Illinois beaches are safe from asbestos-contamination?
6. I made a simple statement in my letter to you on February 7, 2006 which said, "***You need to pay more attention to the motives, activities, and claims made by your Illinois partners regarding tremolite and other microscopic asbestos contamination along the Illinois Lake Michigan shoreline.***" What assurances can you provide me (beyond your impersonal form letter) that HHS, CDC, and ATSDR will investigate my charges regarding the behavior of your Illinois partners that you fund and support?

You must compel your staff to respond immediately to my appeal and answer the **simple** request contained in my July 26, 2005 request for correction that asks:

1. ***There should be a qualifier added to the document stating the health assessment is no longer valid because analytical data used to determine that there is "no significant public health threat at IBSP due to asbestos exposure" is not supported by current science on public risk to asbestos exposure in contaminated soils.***
2. ***A qualifier should be placed on the document stating it should not be cited or quoted and that the report is no longer valid as a public health assessment.***



Note: This information is provided for historical reference purposes only. It is now outdated and no longer valid as a Public Health Assessment based on new knowledge and science of asbestos risk. Do not cite this document as a valid Public Health Assessment.

Your agency has taken significant and valuable time in their delay responding accurately to my July 26, 2005 request for correction. These delay tactics by your staff and your ignoring of the misbehavior of your staff must end. I understand that by making the corrections I request you will also have to address the same issues with

scores of other asbestos PHA's from around the country that used this same flawed risk approach throughout the years. However, your agency has known for quite some time that the 1% asbestos threshold and aggressive outdoor clearance air sampling are not measures used to evaluate risks from asbestos exposures to human health. Your agency should have taken the necessary actions I request years ago. How many citizens of Illinois must be exposed to tremolite and other asbestos fibers before you decide to stop stalling and respond in a manner that is protective of human health?

These delay tactics have caused millions of citizens of Illinois to be unwittingly exposed to asbestos, including tremolite. It is difficult to imagine how ATSDR, CDC, and HHS, in order to cover-up their own incompetence, would manipulate and skew data while adults and children are exposed to inhaling these microscopic asbestos fibers on the Illinois shoreline. What would you think, as a parent, that your children were building sand castles in sand that contained the most deadly form of the asbestos mineral, tremolite asbestos, and you found out that public officials who are supposed to protect you skewed and manipulated data to save their own hides? Indictments were recently issued to officials in Libby, Montana for doing just that.

Stop delegating your responsibilities to incompetent staff that are out to protect themselves, their state partners, and possibly their superiors. Show some leadership in managing and adhering to the policies of your agencies and accept nothing less than scientific truth. I look forward to a prompt and complete response from you to this letter and my July 26, 2005 request for correction regarding your 2000 PHA of asbestos-contamination at Illinois Beach State Park. You must also demand a full response from your staff to charges found in my December 2005 appeal.

I request that you rescind the last 60 day extension to my appeal that your staff wrote in February 2006 and compel your staff to immediately honor my original request for correction from July 2005.

Cordially,

Jeffery C. Camplin

Jeffery C. Camplin, CSP, CPEA

c: Office of Inspector General, Department of Health and Human Services
Michael O. Leavitt, Secretary of the U.S. Department of Health and Human Services
Howard Frumkin, MD, DrPH, ATSDR Director

Jeffery C. Camplin, CSP
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April 17, 2006

Centers for Disease Control and Prevention
Office of the Director
1600 Clifton Road, N.E., Mailstop D-14
Atlanta, Georgia 30333

To: Julie Louise Gerberding, M.D., M.P.H.
Director of CDC, Administrator of ATSDR

Re: **HHS Cover-up: Refuses to Fix Flawed Asbestos PHA Ignoring Tremolite in Sand**

- **CDC Allows Millions to be Exposed to Unknown Asbestos Risks for Six Years**
- **CDC Hides Knowledge of Citizens' Asbestos Exposure to Deadly Tremolite**
- **Surreptitious Involvement by ATSDR Regional and Atlanta HQ Staff Uncovered**
- **ATSDR Staff Politically Motivated in New Secret Asbestos Study Cover-up by State**
- **CDC Director Gerberding Asked to Admit Agency Mistakes and Protect the Public**

Dear Dr. Gerberding,

I wrote to you on March 13, 2006 to inform you that your staff had not answered the request for information correction that I made in July, 2005 regarding an outdated asbestos public health assessment conducted at Illinois Beach State Park. Your Chief Science Officer; Dr. Dixie Schneider, embarrassed your agency when he refused to properly answer my request in his non-responsive December, 2005 reply. Instead, your Chief Science Officer made unsupported and knowingly false statements in his December correspondence with me. I quickly appealed his misleading and inaccurate reply demanding a proper response from the Department of Health and Human Services. I followed up with a letter to you on February 7, 2006 in which I predicted your agency would once again delay a response to my appeal so your staff could surreptitiously assist your Illinois partners with a non-transparent, activity-based asbestos study to cover-up for your lack of diligence in responding to my July, 2005 information correction request. You wrote back to me on February 23, 2006 stating a prompt response was forthcoming. Unfortunately your lack of oversight on this issue surfaced when your agency delayed responding to my appeal for an additional 60 days. I wrote to you on March 13, 2006 requesting that you immediately overturn this delay and promptly respond. I also asked that you request your Illinois partners to conduct the activity-based air monitoring in a publicly inclusive transparent format. You never responded to these requests to conduct asbestos risk assessment activities in an open and transparent manner.

Since I wrote to you last month I discovered that ATSDR Region 5, Region 8, and your Atlanta headquarters staff have been leading participants in the development of activity-based asbestos air testing at Illinois Beach State Park. In fact, your agency has funded a risk-based evaluation of the activity-based asbestos testing being conducted by the Illinois Department of Natural Resources later this spring. I asked you in my February and March, 2006 letters to request that the Illinois Department of Natural Resources asbestos study be conducted in an open and transparent manner with public involvement. You have decided to remain silent on my request. The Illinois Department of Natural Resources has officially denied our request to review the work plan for this new asbestos risk study, citing your agency as the reason for keeping the public out.

- Why won't you request that this important asbestos risk evaluation be made open and transparent to the public? It is apparent that you are involved in a cover-up of flawed studies and unknown asbestos public health risks at Illinois Beach State Park with your Illinois partners.
- Why did your agency proactively approach the Illinois Department of Natural Resources and request involvement in this secret study? It is because you need to cover-up your shameful defense of an outdated and flawed asbestos public health assessment that never evaluated public risk to airborne asbestos at Illinois Beach State Park. This has resulted in asbestos exposures to millions of citizens who were allowed back into an asbestos-contaminated area after an inadequate clean-up.
- Why does your agency continue to stall responding to my request to label your faulty 2000 public health assessment as outdated? You fail to respond because you cannot explain why your agency remained silent for six years while millions of Illinois citizens visited a shoreline contaminated with microscopic asbestos fibers including tremolite asbestos.
- Why does your agency sit quietly while millions of citizens are exposed to unknown airborne asbestos risks? Your agency does not want to take responsibility for potential harms to the public health that have occurred over the last six years to millions of citizens by allowing a flawed and outdated asbestos public health assessment to downplay known asbestos hazards in public areas.

Your agency's complacency in addressing asbestos-contamination at Illinois Beach State Park has now resulted in this contamination spreading as far south as Oak Street Beach in Chicago where tremolite and other toxic asbestos fibers were found in 2005. The silence of your agency is harming the public. Our Illinois Lake Michigan tremolite asbestos-contaminated shoreline is now considered "Libby East."

You have delayed responding to my request for information correction for nine months. It is estimated that two million people have been exposed to microscopic asbestos fibers at Illinois Beach State Park during your unjustified delay. Who knows how many others have been exposed along the 40 miles of asbestos-contaminated shoreline of communities to the south on the North Shore and Chicago. A response to my appeal is due this Thursday, April 20, 2006. I fear your agency will once again delay a proper response so that the secret asbestos activity-based air sampling that you are leading with your Illinois partners will be completed. You need a new report that finds no asbestos risk to the public so you can hide the fact that your agency remained silent for six years as parents and children were exposed to microscopic asbestos, including tremolite. How many more will be exposed to asbestos on our beaches as you sit silently while covering-up your agency's past mistakes and your staff's current misconduct?

I have recently come across several individuals in Lake County, Illinois that have non-occupational mesothelioma. They have a history of visiting Illinois Beach State Park. Lake County, Illinois has an occupational mesothelioma death rate nearly seven times above what is expected. Now the community related mesothelioma cases are appearing. How many new cases of non-occupational mesothelioma will manifest themselves from airborne asbestos exposures that have occurred over the last six years? The same six years your agency did nothing to protect the public. The same six years your agency defended a flawed and outdated public health assessment that citizens of Illinois depended upon for the safety of their families. How much longer will your agency remain silent on this issue? How much longer will your agency work against public health?

You spoke at the James E. Webb Lecture on November 18, 2004, in Washington, DC. In this presentation you cited how your agency had responded poorly to the occupational vs. community exposures to asbestos hazards at Libby, Montana. You stated:

"As we have tried to build a less structured CDC, we have developed some clusters. For example, it may not be intuitively obvious why we have three infectious disease centers but they are working together in a cluster to try to get efficiencies of shared business services and look for synergy and innovation across each other. Meanwhile, other parts have overlapping interests but no real integrated systems."

For example, vermiculite—a toxin—has plagued the community of Libby, Montana. When this asbestos product first became a problem, our Agency for Toxic Substances went there to help the community. Unknown to them at the time was that our Occupational Safety and Health Group already had been there since workers had been affected. Many years lapsed between the time when we knew this was an occupational issue and when we knew it was a community issue.”

Now we have a lapse in time when your agency knew a flawed public health assessment published in 2000 did not accurately evaluate asbestos exposures to millions of men, women and children along the Illinois Lake Michigan shoreline. Instead of correcting this public health assessment, your agency decided to defend this scientifically bankrupt document which fraudulently claims there is no significant health risk from asbestos exposure along the Illinois Lake Michigan shoreline. This indefensible position places millions of citizens at risk when they visit this tremolite (and other toxic forms of non-indigenous microscopic asbestos) contaminated shoreline. These unwitting asbestos-exposed citizens have blindly relied upon the CDC and its partners’ previous conclusions that no airborne asbestos risks are present at Illinois Beach State Park for their safety. Since this non-factual public health assessment was released six years ago, nearly 2 million visitors per year have been exposed to the microscopic asbestos hazards that lay undefined in the beach sands. Many millions more have been exposed to asbestos along shoreline communities to the south, including Chicago. Yet, all your agency can do is to avoid answering my July, 2005 challenge to this flawed public health assessment and delay a proper response to my December, 2005 appeal.

It is time for your agency to admit that it made mistakes in the past. It is time that your agency takes responsibility for an outdated and flawed public health assessment. It is time that your agency involves the public as a partner in resolving the uncertainty in health risks created from microscopic asbestos fibers that have plagued our community for decades. Practice what you preach. Protect our community in an open and transparent manner. The first step is to properly respond to my outstanding request for information correction from July, 2005: do not allow your outdated 2000 public health assessment to be cited as a valid risk study. Next, demand that your Illinois partners immediately allow public review and oversight of any new studies or reports that are designed to evaluate public health risks from asbestos exposure. Finally, your agency must lead an investigation into the occurrence of non-occupational asbestos diseases in Lake and Cook County, Illinois.

The integrity of your agency is at a crossroads. Do you choose science and sound risk-based policy or do you choose political cover-up? I guess we will find out this Thursday when you respond to my appeal.

Will you end your agency’s silence on this matter and respond to my charges? I look forward to your response.

Cordially,

Jeffery C. Camplin

Jeffery C. Camplin, CSP, CPEA

c: Office of Inspector General, Department of Health and Human Services
Michael O. Leavitt, Secretary of the U.S. Department of Health and Human Services
Howard Frumkin, MD, DrPH, ATSDR Director

May 19, 2006

Center for Disease Control and Prevention
Mail Stop D-14
Atlanta GA 30329-4018

Attention: Lynn Austin, Ph.D., Chief of Staff

Subject: Asbestos Public Health Emergency
Illinois Beach State Park, Zion, Illinois

Dear Dr. Austin,

I received your response letter dated April 25, 2006. In your letter, you stated and requested that, *"In the meantime, to be respectful of your time and efforts, unless you have new information regarding IBSP, please accept this letter as a final interim response while waiting to hear from CDC regarding your letters to CDC and HHS."* I am compelled and obligated to provide you with the following new information because the health and safety of the public is at stake and your responses have been late and inappropriate. Please provide me with prompt answers to the following inquiries.

1. I challenged ATSDR findings of the 2000 Public Health Assessment for Illinois Beach State Park through a Request for Information Correction on July 28, 2005. Your agency delayed responding until December, 2005, yet failed to answer my request for information correction. I filed a detailed, highly critical appeal of the non-response to my request for information correction by CDC's Chief Science Officer Dixie Schneider. Since my appeal to your non-response was filed in December, 2005, I have received two, 60-day delays from your agency. I have still not received a proper and complete response. Your new response date is June, 2006, nearly one year from my initial challenge of the 2000 PHA. Dr. Gerberding stated back in April, 2006 that a timely response was forthcoming. Unfortunately, a few days later I once again received a letter informing me a response would be delayed until June 20, 2006. This is unacceptable for such a simple request. Will you respond to my appeal immediately?
2. I expect the current validity of the 2000 PHA to be judged on its own. Your agency has attempted to cite newer "interim" studies in hopes of somehow saving the defective and doomed 2000 PHA. The 2000 PHA was based upon data collected in 1998. I accurately challenged this data as not evaluating human health risk to asbestos. The 2000 PHA and its conclusions should only be defended based upon the data that was used to write it. That data has been shown to be skewed and defective and appears to be scientific fraud. Your current attempt to use smoke and mirrors (using non-applicable interim studies performed years later to defend the fatal flaws of the 2000 PHA) is unprofessional and is using flawed, rigged data to shore up other rigged reports to make it appear that the health and safety of the public is being addressed. Answer the simple question which is, "Does the data used in the 2000 PHA support the findings?" If not, then the 2000 PHA must be labeled as no longer valid based upon current risk assessment protocols. Will you respond to my appeal immediately?
3. ATSDR/CDC is now colluding with its Illinois partners to downplay the chronic findings of visible and microscopic asbestos on public shorelines that 1.5 to 2 million visitors are

unwittingly exposed to each inhaling microscopic asbestos each year since its initial discovery in 1990. ATSDR/CDC appears now to be involved in a cover-up of the bungling and misinterpretation of previous studies at IBSP that falsely which were rigged and “cooked” to make it appear that the beaches are safe. You are now assisting IDNR in performing activity-based asbestos exposure scenarios that allegedly mirror typical or expected beach activities. I have asked your agency to open up this study on the front end of its design for public involvement and comment. Your agency refused to allow any public involvement in the design of this study. I have now obtained a copy of the final study parameters and have once again identified fatal flaws in the scope of work in your agency’s new study. You and your Illinois partners are about to launch into a further cover-up the past “cooked” and rigged studies and attempt to tell the public that the beaches in Illinois are safe and it’s OK for beach users to sit amongst fragmented asbestos-containing waste pieces and inhale the visible fibers in the sand, some of which is tremolite and amosite.

- a. The activity-based air testing at IBSP is being conducted in late May, 2006. It is my understanding the activity-based air testing is scheduled for next week (May 22-26, 2006). Zion, Illinois has received precipitation every day for the last 10 days. The beach sands are saturated. It is inappropriate to state that activities conducted on saturated beach sand in the damp month of May will represent exposure scenarios found in hot, dry, summer months of July and August. Your schedule for releasing your findings is listed as September, 2006. This is after the beach season has ended. Therefore, there is no need to rush the activity-based tests for this year’s beach season. Why won’t you and your Illinois partners perform the activity-based tests in the hot, dry, months of July and August instead of the record breaker month for rain this May?
- b. Aside from the unusually wet season, the moisture and dampness embedded in the sand through the winter months is not released until approximately late June. After that, typical beach moisture conditions begin and the hot, dry summer days attract crowds of people who are exposed to the more readily released fibers. Why are you allowing your partners to rig the sampling protocols by conducting activity-based asbestos testing in May when the beaches are saturated?
- c. Dr. Schneider addressed the inappropriateness of performing activity-based air testing during damp months when he responded to my July, 2005 Request for Information Correction. I wrote that the 1998 air testing at IBSP that was used in the 2000 PHA was conducted on a wet beach. Dr. Schneider wrote:

“The next concern raised is the seasonality of the sampling that occurred for the IBSP PHA. Even though leaf blowers were used to suspend asbestos fibers in to the air, ATSDR agrees that had the samples been collected during a dry summer they would have been more representative of a ‘worst case scenario’.”

Your agency claims this new activity-based testing scheduled for the damp month of May, 2006 was necessary because *“ATSDR reviewers felt that there were some uncertainties in the exposure assessment, and recommended activity-based sampling to more directly evaluate the levels of asbestos exposure for people using the beach.”* Wouldn’t activity-based testing in the hot, dry, months of July and August provide a better evaluation of levels of people using the beach to clarify the “uncertainties” of previous studies, particularly when there are many more people on the beaches when children are out of school?

- d. Your agency determined that there were no asbestos clusters on the beaches based upon the location of where asbestos chunks had been located and removed over the last two years. Your activity-based testing will evaluate airborne microscopic asbestos and not

- airborne chunks. There is no correlation between the visible chunks of debris and the location of where microscopic asbestos fibers might cluster on a beach area. The visible chunks previously tested on IBSP contain chrysotile asbestos. Beach samples taken in 2004 found asbestos fibers other than chrysotile in beach sand, which would indicate other sources of the microscopic asbestos fibers on the beaches. Therefore, why isn't your agency taking sand samples to determine whether microscopic asbestos fiber clusters are present on the beaches? Or, are ATSDR/CDC and its partners avoiding dealing with the sources of the asbestos fibers in order to skew the results?
- e. Your agency's study does not evaluate take-home asbestos-contamination that would occur when families bring asbestos-contaminated belongings into their cars and back to their homes. You have also disregarded the exposure of the state employees and their subcontractors who have worked on the beaches over the years. Why is your activity-based study excluding activities that occur off-site of the beaches where microscopic asbestos-contamination from IBSP will be taken home by beach visitors, park staff, and subcontractors?
 - f. Your agency's study will allow activity-based testing to be performed 24 hours after precipitation has occurred for many days. The USEPA provided comments on this study stating activity-based testing should not be conducted until at least 48 hours had passed after precipitation has occurred. May 18 marked the ninth consecutive day this month of measurable rain, making this May one of the wettest on record. Next week, rain is predicted for every day but one according to the WGN forecast in the Chicago Tribune. Why did your agency schedule activity-based testing for next week when the USEPA recommends a 48 hour wait time?
 - g. Your agency requires moisture testing yet does not set a maximum moisture level under which the activity-based testing will occur. Moisture in beach sand will be much less in July and August than it is in May. ATSDR/CDC will waste taxpayer dollars on futile testing which will have predictable results neatly covering your past mistakes and rigging. Why didn't your agency establish maximum moisture levels in sand that cannot be exceeded prior to conducting the activity-based testing, otherwise, the results would be significantly skewed?
 - h. Your agency's citing of the interim UIC report in the Exposure Investigation Protocol is inappropriate. Your agency found "uncertainties" in the findings of the UIC interim report, yet still cites this inconclusive, interim report by stating, *"Available analysis indicate that while exposure to asbestos is possible in these activities, it is likely that even under worst case situations to be well below 1 in 1,000,000 lifetime risk range."* In general, it is known that the data generated in the UIC Interim Report is manipulated, rigged, and does not support the report's conclusions. It is extraordinarily inappropriate for your agency to have "dirtied" its hands in dealing with its partners and contaminated its own integrity. How can ATSDR find that the UIC interim report has uncertainties requiring activity-based support, but still cite these uncertain UIC "finding" in the Exposure Investigation activity-based protocol?
 - i. Your agency's Exposure Investigation Protocol included the PSI (consultant who will perform the activity-based testing) proposed work plan. I understand that this document has been reviewed and modified multiple times from comments received from your agency over an eight-month period. I was quite surprised to read that PSI was using asbestos exposure monitoring from previous beach clean-up activities to represent exposures during the activity-based testing. PSI states, *"Based on this data, it is not anticipated that the exposure level shall exceed the OSHA permissible exposure limit of 0.1 f/cc. Therefore, personal protective equipment for airborne asbestos fibers shall not*

be required.” The beach clean-up protocol that PSI uses as a negative exposure assessment for your agency’s study is designed to minimize fiber disturbance and generation. On the other hand, the activity-based protocol in your agency’s study is specifically designed to disturb asbestos fibers. PSI’s justification for not wearing a respirator is based on significantly flawed data that hides the true risk exposure for the personnel. Your partners and the consultant PSI are more concerned about appearing on the beaches with respirators for the public to view than the health and safety of the workers. Is public visibility also why activity-based testing is scheduled in May as opposed to the busy month of July? Why would your agency approve and allow the practice of non-mandatory respiratory use for personnel involved in the activity-based study using an inappropriate negative exposure assessment?

There are many more comments I have on the Exposure Investigation Protocol for IBSP that have been finalized by your agency. I am asking that you delay your investigation so that activity-based testing can occur in appropriate and representative summer months of July and August for beach activities. This would also give us time to meet and discuss the other issues I have with your agency’s activity-based testing and proposed risk assessment criteria. All of the previous studies and asbestos risk assessments conducted at IBSP with involvement of your agency have significant, fatal flaws. It is apparent that your agency’s new exposure investigation protocol designed to resolve these “uncertainties” of previous reports will only further enhance the “uncertainties” regarding the public’s asbestos exposures at IBSP. Will you delay your activity-based testing until July, 2006 and allow me to prepare and present my complete comments to your agency?

Thank you for your prompt attention to these matters because the health and safety of the public is at stake.

Cordially,

Jeffery C. Camplin

c: Office of Inspector General, Department of Health and Human Services
Michael O. Leavitt, Secretary of the U.S. Department of Health and Human Services
Howard Frumkin, MD, DrPH, ATSDR Director
Julie Louise Gerberding, M.D., M.P.H., Director of CDC, Administrator of ATSDR
James T. Durant MSPH, CIH, ATSDR Exposure Investigation Team
Drue H. Barrett, Ph.D., Acting Associate Director for Science, ATSDR
Illinois Dunesland Preservation Society

Exposure Investigation Report

Illinois Beach State Park



Prepared by

James T. Durant, MSPH CIH
Exposure Investigations and Site Assessment Branch
Agency for Toxic Substances and Disease Registry

Executive Summary

This Exposure Investigation (EI) was conducted jointly with the Illinois Department of Natural Resources (IDNR) to examine asbestos exposure to users of the Adeline Jay Geo-Karis Illinois Beach State Park (IBSP). Past studies of IBSP have found asbestos-containing material and asbestos fibers in beach sands. This EI has been developed to address uncertainties regarding exposure levels to individuals who utilize the beach areas at IBSP by measuring exposure during simulated activities. The results of this sampling support the conclusion that routine recreational use of the beaches at IBSP does not pose an apparent public health hazard. Using the current IRIS slope factor for asbestos, the lifetime risk from this exposure was within the acceptable risk range. As a precaution to reduce releases during beach maintenance activities, intensive disturbances of the sand should be conducted during conditions when the sand surface is wet or when the park area being maintained is closed to the public. IDNR should continue efforts to remove asbestos containing materials from the beach and continue educational activities to help visitors identify and avoid asbestos containing material.

Executive Summary	i
Objectives and Rationale	1
Background	1
Methods.....	2
Location Selection	3
Environmental Sampling	4
Data Collection/Sampling Procedures	4
Activity descriptions	4
Laboratory Analytic Procedures	5
Data Analysis Procedures	6
Methods for Measuring Asbestos Content.....	6
Asbestos Health Effects and Toxicity	7
Current Standards, Regulations, and Recommendations for Asbestos.....	8
Results.....	10
Asbestos Analysis- Air Samples.....	10
Asbestos Analysis- Bulk Samples	10
Moisture Analysis	11
Discussion	11
Application of IRIS Inhalation Unit Risk Factor and use of draft Superfund Methodology.....	12
Limitations and Uncertainties	13
Child Health Considerations	13
Conclusions.....	14
Recommendations.....	14
Authors, Technical Advisors	15
References.....	16
Appendix A Figures.....	19
Appendix B Tables	25
Appendix C Exposure Investigation Protocol.....	31

Objectives and Rationale

In June of 2005, ATSDR was asked by the Great Lakes Center for Excellence in Environmental Health at the University of Illinois-Chicago (UIC) School of Public Health to comment on their draft report, *Illinois State Beach Park (IBSP): Determination of Asbestos Contamination in Beach Nourishment Sand, Interim Report* [1]. The UIC study evaluated the levels of asbestos in various beach areas at IBSP, comparing the results to other beaches on the southwestern shoreline of Lake Michigan. Sample preparation and analysis was performed using the Superfund Method for the Determination of Releasable Asbestos in Soils and Bulk Materials (EPA 540-R-97-028, 1997) as modified by the Draft Elutriator Method for the Determination of Asbestos in Soils and Bulk Material [2,3]. This method analyzes the abundance of asbestos structures per gram of airborne particulate matter up to 10 micrometers in size (PM10) in the sample material. Results of this study found statistically elevated levels of asbestos structures releasable from the sand in IBSP North unit sand relative to other background beaches. However, the estimated levels of asbestos exposure were significantly below the risk levels used by EPA as a threshold for taking action. Overall, ATSDR scientists agreed with the conclusions of the risk assessment, however, ATSDR reviewers felt that there were some uncertainties in the exposure assessment. They recommended activity-based sampling to confirm the elutriator findings and to better refine the types of activity releasing fibers to the air.

Illinois Department of Natural Resources (IDNR) requested the support of ATSDR in planning for an activity-based sampling effort at the IBSP. This investigation represented an opportunity for ATSDR to work collaboratively with the IDNR and the Illinois Department of Public Health to help address the issues raised by ATSDR's review of the UIC report.

Background

Illinois Beach State Park consists of 6.5 miles of Lake Michigan shoreline in the city of Zion, Lake County, Illinois. It is bordered by the Wisconsin state line to the north, Lake Michigan to the east, the town of Zion to the west, and the Johns-Manville National Priorities List (NPL) hazardous waste site to the south [1]. The Park encompasses 4,160 acres of shoreline and received approximately 2.75 million visitors in 1998 [1]. Recreational activities available include camping, swimming, fishing, hiking, bicycling, and picnicking [1]. Facilities within and near the park boundaries include the North Point Marina, a 244-unit campground, two major public swimming areas, several inland fishing ponds, a visitor center, the Commonwealth Edison Power Plant, and the Illinois Beach Resort and Conference Center (Appendix A) [1]. Besides seasonal tourism, the park holds special events that draw visitors, including the In-Campground Camper Show in May and the National Jet Ski Championships in July [1]. A map of the Park is shown in Figure 1, Appendix A.

The park is considered a unique natural resource with the only remaining Lake Michigan beach ridge shoreline left in the state [1]. Glacial advance and retreat created the area that left dunes, swales, marshes, and a variety of wildlife and vegetation in the area [1]. Before becoming a state park, the area was used for military training [1]. In 1948, the State of Illinois acquired the first parcels of what is now Illinois Beach State Park [1].

In late 1997, pieces of transite pipe, siding, and roofing materials suspected of containing asbestos were found scattered along the beach [1]. In February 1998, Illinois Department of Natural Resources collected two bulk samples of the material and found they contained asbestos fibers. Following this discovery, Illinois Department of Natural Resources began an investigation to determine the extent and possible source of asbestos contamination. Potential sources include:

- Former beachfront homes that have since washed into Lake Michigan. Much of the material found at the Park is common construction material used in the past. According to historical maps, the present lakeshore contained about 232 homes that wave action destroyed and washed into the lake (Appendix A, Figures 2 and 3).
- The Johns-Manville site immediately south of the Park. This plant manufactured a variety of roofing, flooring, wall covering, and insulating materials from 1922 - 1988. The raw materials used at Johns-Manville include Portland cement, asphalt, paper, and asbestos. A 150-acre parcel of the property was used for disposal of asbestos containing material (ACM) and was placed on the NPL in 1983 [4].
- Several sources of nourishment sand have been used at the beach. Currently, IBSP requires 80,000 – 100,000 cubic yards of sand per year to prevent erosion, particularly to the North Unit beaches [1]. The tests for asbestos in the wide variety of past and potential sources of nourishment sand for IBSP has previously been reviewed [1]. In general, some of these sand sources have been visually inspected for asbestos containing materials or tested for asbestos using either polarized light microscopy or with transmission electron microscopy [1]. Asbestos was detected in some of these samples at low levels.
- A former rifle range in the Camp Logan area. The rifle range was built for the 1959 Pan American games and contained a large berm built with factory waste material donated by Johns-Manville. Wave action may have destroyed this berm that also potentially contained ACM.

Methods

A. Exposure Investigation Design

Monitoring was intended to characterize the potential for exposure during **specific-case scenarios** to airborne asbestos fibers at the Illinois Beach State Park. This was accomplished by collecting personal air samples of persons mimicking activities that normally occur at the beach. The specific-case scenarios for exposure activities were selected so that they would generate varying degrees of potential exposures. Sand castle building and beach maintenance were selected because they represent the upper bound of exposure activities. Sand castle building represents a high exposure activity for children and beach maintenance represents the maximum beach disturbance of all human activities. The specific-case scenarios conducted are shown on Appendix B, Table 1.

Location Selection

To determine where to sample along the beach, ATSDR was interested in determining if different areas of the beach might be more contaminated than other areas. This would allow ATSDR to select a “worse case” area of the beach for testing. ATSDR suspected that the major contributor to asbestos on the beach was asbestos contaminated materials (ACM) that had washed ashore. The agency wanted to determine if ACM was clustered in certain areas of the beach, thus leading to

increased asbestos

contamination in these areas.

To determine this, ATSDR used data collected during the routine beach sweeps that are performed to remove suspected ACM from the beach.

Suspected asbestos contaminated debris are picked up on the beach by a contractor on a routine basis, and their locations fixed using a global positioning system (GPS).

ATSDR plotted these locations from 2005 (Appendix A, Figure 4). Visually, there was higher density of debris found south of the Dead River. This is within the nature preserve of the IBSP, and recreational use of this area is not allowed. To test if this pattern was due to random chance, ATSDR examined the data using two different cluster analysis techniques, Nearest Neighbor Analysis and Local Moran's I test. Both tests indicated that the location of suspect asbestos containing debris was randomly occurring and was not clustering in any particular area.

Nearest Neighbor Analysis

Nearest Neighbor Analysis examines the spacing of individual points across space. This test compares the observed mean distances between neighboring points with the expected mean distances based on a theoretical random pattern. As such, if the observed mean distance is greater than that of the random pattern mean distance, then the observed point pattern is considered more dispersed than the random point pattern. Conversely, if the observed mean distance is less than that of the random pattern mean distance, then the observed point pattern is considered more clustered than the random point pattern. The result of the test is a z-score, which can be compared to the standard normal distribution to determine the significance of the test. At a confidence level of 95%, a z-score would have to be less than -1.96 or greater than 1.96 to be statistically significant. A negative z-score indicates clustering while a positive z-score indicates dispersion. In this analysis, the high positive z-score of 8.9 indicates that a high degree of dispersion.

Local Moran's I Analysis

Local Moran's I is a translation of a non-spatial correlation measure to a spatial context. It examines for clusters of points by identifying samples surrounded by similar samples. The cluster analysis output is an index value and a z-score for each sample. A significant positive z-score indicates the clustering of similar points near a sample. In the analysis of IBSP debris, no samples with a significant positive z-score were found, indicating no clustering near any sample.

Therefore, to select areas to be examined, ATSDR could not use debris clustering as a criteria and turned to the previous sampling by UIC. This study examined aerosilizable asbestos content in IBSP sands. Sampling locations for the sand castle building scenario were selected in areas where the UIC study detected aerosilizable asbestos [1].

Environmental Sampling

Licensed contractors or employees working for the state of Illinois collected activity-based samples, using procedures consistent with the site Health and Safety Plan. These individuals replicated many activities that will normally occur by beach-goers at Illinois Beach State Park. Efforts were made to reduce potential exposure to the public by conducting the sampling in the late spring during weekday hours, or during the summer after the park had closed.

Data Collection/Sampling Procedures

Sampling procedures are outlined in the attached Exposure Investigation Protocol and Project Execution Manual. This manual is attached as part of the EI Protocol in Appendix C.

The sand castle scenarios lasted approximately 4 hours at each location. Wind speed and direction were noted from the National Climate Data Center meteorological station at Waukegan/Chicago regional airport (WBAN #14880). ATSDR also utilized an on site meteorological station. To minimize the effects of high humidity or elevated soil moisture content, all activities were conducted at least 24 hours after a measurable rain event. Sample locations for air samples are shown in Appendix A, Figure 5.

Activity descriptions

Sandcastle building and/or digging in the sand was performed to mimic what a child might be exposed to while playing in the sand. Two general sampling areas were selected based on UIC study locations where low levels of aerosolizable asbestos were detected. One area was located at UIC sample location IBSP-05S in the South Unit, the other location was between UIC sample locations IBSP-21A and IBSP-23A in the North Unit. At each area, four sample locations were selected. Two locations were within 10 feet of the surfline and two locations in dryer sand away from the surf. Study subjects used typical beach sized tools and pails to disturb the sand by digging and piling the sand within the area. The sampling period was divided into equal sub-periods to facilitate having the participant face each compass direction for an equal amount of time during the activity. This approach was designed to average the effect of wind direction on potential exposure. Random head and body movement during the activity should have further mitigated the impact of wind direction on exposure. Participants turned every 15 minutes for the entire sampling period.

According to Illinois Department of Natural Resources officials, employees may engage in beach maintenance activities that involve using a grader. This activity was monitored to simulate what bystanders could be potentially exposed to and to characterize the maximum possible release of asbestos from the sand. For this monitoring, sampling pumps were used to collect air samples on the grader, with samplers located at approximately four feet in height. Four duplicate samples were collected simultaneously. Two samplers were set to collect air at 3 liters per minute (lpm), and two were set to collect air at 4 lpm.

Laboratory Analytic Procedures

Air Samples

Analysis of air samples was performed by transmission electron microscopy (TEM). The specific methodology used was the International Standards Organization (ISO) method 10312, Phase Contrast Microscopy equivalents (PCMe) section. The samples were analyzed with a detection limit of 0.0005 asbestos fibers per cubic centimeter (f/cc). From the TEM analysis, phase contrast microscopy equivalents (PCMe) were calculated by counting asbestos structures that would have been counted had the sample been analyzed using Phase Contrast Microscopy methods (see discussion of Methods of Measuring Asbestos Content, below). The method was modified to include fibers of all diameters greater than 0.25 micrometers instead of limiting the analysis to those between 0.2 and 3 micrometers in diameter. This modification was made to make the fiber counts equivalent to Phase Contrast Microscopy measurements, which is what the EPA unit inhalation risk factor is based on [5].

Sand Bulk Samples – asbestos analysis

The samples were analyzed for asbestos following the polarized light microscopy and analytical electron microscopy procedures as described in the U.S. Environmental Protection Agency *Test Method EPA/600/R-93/116 - Method for the Determination of Asbestos in Bulk Building Materials* [7]. In order to detect levels of asbestos less than 1%, a sieving procedure was used as described in the US Environmental Protection Agency, The Protocol for Screening Soil and Sediment Samples for Asbestos Content Used by the US Environmental Protection Agency, Region 1 Laboratory [8].

The samples were examined under an Olympus SX-40 stereomicroscope at magnifications from 7 to 40 times. A representative portion of each sample amounting to approximately ¼ of the sample volume was poured into plastic laboratory sample trays. Tweezers, needles, and spatulas were used to carefully examine the sand under the stereomicroscope to detect any visible fibrous components. If fibrous components had been found, polarized light microscopy would have been used to identify the fiber type.

To determine the detection limit for this method when used with a sand matrix a control spiked sample (0.1% chrysotile) was prepared. A 4.4995 gram portion of a sample was weighed and spiked with 0.005 grams of reference chrysotile that had been processed to reduce fiber length. Fiber length was reduced to simulate what was expected to be found in the environmental samples, and because shorter fibers are harder to detect microscopically. A suspension was prepared with the asbestos and dispersant which was then mildly sonicated to disperse the asbestos fibers. The sand and the chrysotile suspension were then combined and thoroughly mixed, and then dried and analyzed. Chrysotile was easily detected in the 0.10% chrysotile mixture by weight by the above method.

To detect asbestos fibers too small to be found by light microscope inspection, each sample was prepared for TEM analysis. Sand grains are too large to be put into suspension, so a rinse procedure was used to collect the fine fraction of particles associated with the sand, following the rinse procedure outlined in *The Protocol for Screening Soil and Sediment Samples for Asbestos Content Used by the US Environmental Protection Agency, Region 1 Laboratory* [8]. A representative five gram portion of each sample was obtained by the cone and quarter method.

The subsample was rinsed using 100 milliliter (ml) of deionized water and a 250 micrometer (μm) sieve. A known portion of the rinse suspension was then filtered through a 0.2 μm , 47 mm diameter polycarbonate filter and prepared for TEM analysis.

Sand Bulk Samples – Solids Analysis

To determine the moisture content of the sand, samples were submitted to EPA Chicago Regional Laboratory for analysis of percent total solids, using the Standard Operating Procedure AIG0919 (Revision 2).

Data Analysis Procedures

Asbestos is a general name applied to a group of silicate minerals consisting of thin, separable fibers in substantially parallel sides. Asbestos minerals fall into two groups, serpentine and amphibole. Serpentine asbestos has relatively long and flexible crystalline fibers; this class includes chrysotile, the predominant type of asbestos used commercially. Fibrous amphibole minerals are brittle and have a rod- or needle-like shape. Amphibole minerals regulated as asbestos by OSHA include five classes: crocidolite, amosite, and the fibrous forms of tremolite, actinolite, and anthophyllite. Other unregulated amphibole minerals, including winchite, richterite, and others, can also exhibit fibrous asbestiform properties [9].

Asbestos fibers do not have any detectable odor or taste. They do not dissolve in water or evaporate into the air, although individual asbestos fibers can easily be suspended in the air. Asbestos fibers do not move through soil. They are resistant to heat, fire, chemical and biological degradation. As such, they can remain virtually unchanged in the environment over long periods of time.

The following sections provide an overview of several concepts relevant to the evaluation of asbestos exposure, including analytical techniques, toxicity and health effects, and the current regulations concerning asbestos in the environment.

Methods for Measuring Asbestos Content

A number of different analytical methods are used to evaluate asbestos content in air, soil, and other bulk materials. Each method varies in its ability to measure fiber characteristics such as length, width, and mineral type.

Phase-Contrast Microscopy (PCM): For air sampling required for worker protection, fiber quantification is traditionally done through PCM by counting fibers with lengths greater than 5 micrometers ($>5 \mu\text{m}$) and with an aspect ratio (length to width) greater than 3:1 [10]. This is the standard method by which workplace regulatory limits were developed. Disadvantages of this method include the inability to detect fibers less than 0.25 (<0.25) μm in diameter and the inability to distinguish between asbestos and non-asbestos fibers [9].

Polarized Light Microscopy (PLM): Asbestos content in soil and bulk material samples is commonly determined using PLM, a method which uses polarized light to compare refractive indices of minerals and can distinguish between asbestos and non-asbestos fibers and between different types of asbestos. The PLM method can detect fibers with lengths greater than approximately 1 μm ($\sim 1 \mu\text{m}$), widths greater than $\sim 0.25 \mu\text{m}$, and aspect ratios (length-to-width ratios) greater than 3. Detection limits for PLM methods are typically 0.25%–1% asbestos.

Scanning Electron Microscopy (SEM): SEM and, more commonly, transmission electron microscopy (TEM) are more sensitive methods that can detect smaller fibers than light microscopic techniques. TEM allows the use of electron diffraction and energy-dispersive x-ray methods, which give information on crystal structure and elemental composition, respectively. This information can be used to determine the elemental composition of the visualized fibers. SEM does not allow measurement of electron diffraction patterns. One disadvantage of electron microscopic methods is that determining asbestos concentration in soil and other bulk material is difficult [9].

Transmission Electron Microscopy (TEM): For risk assessment purposes, TEM measurements are sometimes multiplied by conversion factors to give PCM equivalent fiber concentrations. The correlation between PCM fiber counts and TEM mass measurements is very poor. A conversion between TEM mass and PCM fiber count of 30 micrograms per cubic meter per fiber per cubic centimeter ($\mu\text{g}/\text{m}^3$)/(f/cc) was adopted as a conversion factor, but this value is highly uncertain because it represents an average of conversions ranging from 5 to 150 ($\mu\text{g}/\text{m}^3$)/(f/cc) [11]. The correlation between PCM fiber counts and TEM fiber counts is also very uncertain, and no generally applicable conversion factor exists for these two measurements [11]. Generally, a combination of PCM and TEM is used to describe the fiber population in a particular air sample.

Asbestos Health Effects and Toxicity

Breathing any type of asbestos increases the risk of the following health effects:

Malignant mesothelioma—cancer of the membrane (pleura) that encases the lungs and lines the chest cavity. This cancer can spread to tissues surrounding the lungs or other organs. The great majority of mesothelioma cases are attributable to asbestos exposure [9].

Lung cancer—cancer of the lung tissue, also known as bronchogenic carcinoma. The exact mechanism relating asbestos exposure with lung cancer is not completely understood. The combination of tobacco smoking and asbestos exposure greatly increases the risk of developing lung cancer [9].

Noncancer effects—these include asbestosis, scarring, and reduced lung function caused by asbestos fibers lodged in the lung; pleural plaques, localized or diffuse areas of thickening of the pleura; pleural thickening, extensive thickening of the pleura which may restrict breathing; pleural calcification, calcium deposition on pleural areas thickened from chronic inflammation and scarring; and pleural effusions, fluid buildup in the pleural space between the lungs and the chest cavity [9].

Not enough evidence is available to determine whether inhalation of asbestos increases the risk of cancers at sites other than the lungs, pleura, and abdominal cavity [9].

Ingestion of asbestos causes little or no risk of non-cancer effects. However, some evidence indicates that acute oral exposure might induce precursor lesions of colon cancer and that chronic oral exposure might lead to an increased risk of gastrointestinal tumors [9].

ATSDR considers the inhalation route of exposure to be the most significant in the current evaluation. Exposure scenarios that are protective of the inhalation route of exposure should be protective of dermal and oral exposures.

The scientific community generally accepts the correlations of asbestos toxicity with fiber length as well as fiber mineralogy. Fiber length may play an important role in clearance and mineralogy may affect both biopersistence and surface chemistry. ATSDR, responding to concerns about asbestos fiber toxicity from the World Trade Center disaster, held an expert panel meeting to review fiber size and its role in fiber toxicity in December 2002 [12]. The panel concluded that fiber length plays an important role in toxicity. Fibers with lengths $<5\ \mu\text{m}$ are essentially non-toxic in terms of association with mesothelioma or lung cancer promotion. However, fibers $<5\ \mu\text{m}$ in length may play a role in asbestosis when exposure duration is long and fiber concentrations are high. More information is needed to definitively reach this conclusion.

In accordance with these concepts, it has been suggested that amphibole asbestos is more toxic than chrysotile asbestos, mainly because physical differences allow chrysotile to break down and to be cleared from the lung, whereas amphibole is not removed and builds up to high levels in lung tissue [13]. Some researchers believe the resulting increased duration of exposure to amphibole asbestos significantly increases the risk of mesothelioma and, to a lesser extent, asbestosis and lung cancer [13]. However, OSHA continues to regulate chrysotile and amphibole asbestos as one substance, as both types increase the risk of disease [14]. Currently, EPA's Integrated Risk Information System (IRIS) assessment of asbestos also currently treats mineralogy (and fiber length) as equipotent [11].

Evidence suggesting that the different types of asbestos fibers vary in carcinogenic potency and site specificity is limited by the lack of information on fiber exposure by mineral type. Other data indicate that differences in fiber size distribution and other process differences can contribute at least as much as fiber type to the observed variation in risk [15].

Counting fibers using the regulatory definitions (see below) does not adequately describe risk of health effects. Fiber size, shape, and composition contribute collectively to risks in ways that are still being elucidated. For example, shorter fibers ($<5\ \mu\text{m}$) appear to deposit preferentially in the deep lung, but longer fibers ($>5\ \mu\text{m}$) may disproportionately increase the risk of mesothelioma [9,15]. Some of the unregulated amphibole minerals, such as the winchite (from Libby, MT), can exhibit asbestiform characteristics and contribute to risk. Fiber diameters greater than $2\text{--}5\ \mu\text{m}$ are considered above the upper limit of respirability and thus do not contribute significantly to risk. Methods are being developed to assess the risks posed by varying types of asbestos and are currently awaiting peer review [15].

Current Standards, Regulations, and Recommendations for Asbestos

In industrial applications, asbestos-containing materials are defined as any material with $>1\%$ bulk concentration of asbestos [14,16,17]. It is important to note that 1% is not a health-based level, but instead represents the practical detection limit in the 1970s when OSHA regulations were created. Studies have shown that disturbing soil containing $<1\%$ amphibole asbestos, however, can suspend fibers at levels of health concern [18].

Friable asbestos (asbestos which is crumbly and can be broken down to suspendible fibers) is listed as a hazardous air pollutant on EPA's Toxic Release Inventory [19]. This classification requires companies that release friable asbestos at concentrations $>0.1\%$ to report the release under Section 313 of the Emergency Planning and Community Right-to-Know Act.

OSHA's permissible exposure limit (PEL) is 0.1 f/cc for asbestos fibers with lengths $>5\ \mu\text{m}$ and with an aspect ratio (length:width) $>3:1$, as determined by PCM [14]. This value represents a time-weighted average (TWA) exposure level based on 8 hours per day for a 40-hour work week. In addition, OSHA has defined an "excursion limit," which stipulates that no worker should be exposed in excess of 1 f/cc as averaged over a sampling period of 30 minutes [14]. Historically, the OSHA PEL has steadily decreased from an initial standard of 12 f/cc established in 1971. The PEL levels prior to 1983 were determined on the basis of empirical worker health observations, while the levels set from 1983 forward employed some form of quantitative risk assessment. ATSDR does not, however, support using the PEL for evaluating exposure for community members, because the PEL was developed as an occupational exposure for adult workers.

In response to the World Trade Center disaster in 2001 and an immediate concern about asbestos levels in buildings in the area, the Department of Health and Human Services, EPA, and the Department of Labor formed the Environmental Assessment Working Group. This work group was made up of ATSDR, EPA, CDC's National Center for Environmental Health, the National Institute for Occupational Safety and Health (NIOSH), the New York City Department of Health and Mental Hygiene, the New York State Department of Health, OSHA, and other state, local, and private entities. The work group set a re-occupation level of 0.01 f/cc after cleanup. Continued monitoring was also recommended to limit long-term exposure at this level [20]. In 2002, a multiagency task force headed by EPA was formed specifically to evaluate indoor environments for the presence of contaminants that might pose long-term health risks to residents in Lower Manhattan. The task force, which included staff from ATSDR, developed a health-based benchmark of 0.0009 f/cc for indoor air. This benchmark was developed to be protective under long-term exposure scenarios, and it is based on risk-based criteria that include conservative exposure assumptions and the current EPA cancer slope factor. The 0.0009 f/cc benchmark for indoor air was formulated on the basis of chrysotile fibers and is therefore most appropriately applied to airborne chrysotile fibers [21].

NIOSH has set a recommended exposure limit of 0.1 f/cc for asbestos fibers longer than $5\ \mu\text{m}$. This limit is a TWA for up to a 10-hour workday in a 40-hour work week [22]. The American Conference of Government Industrial Hygienists has also adopted a TWA of 0.1 f/cc as its Threshold Limit Value $\text{\textcircled{R}}$ [23].

EPA has set a maximum contaminant level (MCL) for asbestos fibers in water of 7,000,000 fibers longer than $10\ \mu\text{m}$ per liter, on the basis of an increased risk of developing benign intestinal polyps [24]. Many states use the same value as a human health water quality standard for surface water and groundwater.

Asbestos is a known human carcinogen. Historically, EPA's IRIS model calculated an inhalation unit risk for cancer (cancer slope factor) of 0.23 per f/cc of asbestos [11]. This value estimates additive risk of lung cancer and mesothelioma using a relative risk model for lung cancer and an absolute risk model for mesothelioma.

This quantitative risk model has significant limitations. First, the unit risks were based on measurements with phase contrast microscopy and therefore cannot be applied directly to measurements made with other analytical techniques. Second, the unit risk should not be used if the air concentration exceeds 0.04 f/cc because the slope factor above this concentration might differ from that stated [11]. Perhaps the most significant limitation is that the model does not

consider mineralogy, fiber-size distribution, or other physical aspects of asbestos toxicity. EPA is in the process of updating their asbestos quantitative risk methodology given the limitations of the IRIS model currently used and the knowledge gained since this model was implemented in 1986.

Results

Asbestos Analysis- Air Samples

Asbestos air sampling results are shown in Appendix B, Table . For sand castle playing, a single amphibole fiber was detected in sample 04 523806-TL. Counting this fiber as a PCMe fiber, this single fiber results in an air concentration of <0.0027 f/cc. The results are reported as “less than” because under ISO 10312, when 1 to 3 structures are counted, the result shall be reported as less than the corresponding one-sided upper 95% confidence limit for the Poisson distribution (1 structure – 4.74 times the analytical sensitivity, 2 structures – 6.30 times the analytical sensitivity). Therefore, this concentration should only be regarded as an upper estimate of the actual concentration. All eight sand castle building samples were used to calculate an “average” exposure for sand castle building, with values for non-detect samples set at the analytical sensitivity level of 0.0005 f/cc.

Asbestos concentrations around the beach dragging activity were higher than for the sand castle building activity, presumably due to the more intensive disturbance of the sand surface. For the South Unit, the total PCMe fiber concentrations were 0.0031 f/cc and 0.0036 f/cc. For the North Unit, the beach dragging results were higher than the south unit, with concentrations ranging from non-detect to 0.014 f/cc.

Asbestos Analysis- Bulk Samples

Asbestos structures were not detected using the stereomicroscopic screening method described in Laboratory Analytic Procedures, above, with a detection limit of 0.1% by weight. Using the modified TEM method, some asbestos structures were detected:

Sample #3. The sample was composed of approximately 100% soil minerals (quartz, garnet, magnetite, and other minerals). No asbestos was detected by light microscopy. The detection limit for light microscopy was determined to be less than 0.1%. A chrysotile fiber bundle was detected by TEM analysis. Two amphibole fibers were detected, with spectra generally consistent with amosite, crocidolite, anthophyllite, tremolite, and actinolite. However, the spectra of these amphibole fibers were not completely consistent with the National Institute of Standards and Technology standard reference amphibole asbestos fibers.

Sample #4. The sample was composed of approximately 100% soil minerals (quartz, garnet, magnetite, and other minerals). No asbestos was detected by light microscopy. No fibrous minerals were detected by TEM analysis.

Sample #1. The sample was composed of approximately 100% soil minerals (quartz, garnet, magnetite, and other minerals). No asbestos was detected by light microscopy. Three amphibole fibers were found with spectra generally consistent with amosite, crocidolite, anthophyllite,

tremolite, and actinolite. However, the spectra of these amphibole fibers were not completely consistent with the National Institute of Standards and Technology standard reference amphibole asbestos fibers.

Sample #2. The sample was composed of approximately 100% soil minerals (quartz, garnet, magnetite, and other minerals). No asbestos was detected by light microscopy. The detection limit for light microscopy was determined to be less than 0.1%. A chrysotile fiber was detected by TEM analysis. Two amphibole fibers were detected, with spectra generally consistent with amosite, crocidolite, anthophyllite, tremolite, and actinolite. However, the spectra of these amphibole fibers were not completely consistent with the National Institute of Standards and Technology standard reference amphibole asbestos fibers.

Moisture Analysis

The results for the analysis of percent solids and moisture are shown in Appendix B, Table 3. Some of the samples are labeled with a “J” flag, or estimated value, due to the fact that the holding times were exceeded at the laboratory. However, since these samples were held in a sealed container at -1.4° C, it is unlikely that the delay in the analysis resulted in a significant impact on the results of the soil moisture analysis.

Discussion

The monitoring results of the sand castle playing scenarios failed to produce asbestos levels higher than background. ATSDR used EPA’s asbestos risk model, developed in 1986, to estimate risks posed by exposures from the different activities at IBSP. The 1986 EPA risk model uses a single slope factor which, when multiplied by the lifetime average asbestos fiber exposure, predicts the increased risk of developing cancer (lung cancer and mesothelioma). To estimate the average lifetime asbestos fiber exposure, assumptions must be made regarding the frequency and duration a person would engage in activities at IBSP. In the risk assessment conducted by UIC, exposure frequency was assumed to be from 2 to 4 hours per day, occurring 25 to 50 days per year for 70 years [1]. ATSDR was unable to locate other published exposure factors for the amount of time people recreate on the beach. However, the EPA exposure factors handbook recommends the following exposure factors that are similar to the scenarios evaluated at IBSP:

Swimming: 60 minutes per day (50th percentile) to 180 minutes per day (90th percentile). Recommended frequency is one day per month.

24 hour cumulative number of minutes per day spent at Pool/River/Lake: 150 minutes (50th percentile) to 480 minutes (90th percentile). Exposure factor handbook does not describe frequency of activity

Number of Minutes Spent Playing on Sand, Gravel, Dirt, or Grass When Fill Dirt Was Present:

0 minutes (50th percentile) to 120 minutes (90th percentile). Exposure factors handbook does not describe frequency of activity.

Given the above data, the assumed exposure factors in the UIC report appear slightly over

conservative in regard to frequency and duration people may routinely visit the park and engage in activities that disturb sand. Therefore, ATSDR assumes the same exposure variables for sand castle building (Table 4) [1]. Average lifetime fiber concentration was calculated using the following formula:

$$\text{Avg fiber conc, } \left(\frac{f}{cc} \right) = \text{fiber conc for activity} \times \frac{\text{hr / day}}{24 \text{ hr / day}} \times \frac{\text{days / year}}{365 \text{ days / wk}} \times \frac{\text{yr duration}}{70 - \text{yr lifetime}}$$

Risk Calculated risks from average and reasonable maximum exposure for both sand castle building and beach dragging are within the acceptable lifetime risk range of 1 in 1,000,000 to 1 in 10,000 [25], that EPA uses for making clean-up decisions (Table 6).

The beach grading activity was expected to represent a worst-case exposure scenario, given the fact that it was a fairly intrusive disturbance of the sand surface that would not occur under routine conditions. Since this is also an activity that is not currently being conducted, it is considered to be a more theoretical situation than one that would actually occur. The results of this beach maintenance activity sampling indicated that asbestos fibers could be detected in the air behind the grading device. However, these were also very low levels, Non-detect to 0.014 f/cc, both below the occupational standards for workers. According to park employees, beach grading occurred from Labor Day until Memorial Day, and it lasted from three to four hours. ATSDR calculated approximate risk levels between 6.5 in 1,000,000 to 2.62 in 100,000 (Table 6).

Based on the bulk analysis of sand samples collected, the sand in of itself does not appear to pose a significant source of asbestos fibers. A combination of both PLM and TEM was used to analyze the bulk sand samples that were collected. As previously discussed, TEM is far more sensitive than PLM. However, the disadvantage is that it only looks at a very small portion of the sample, whereas PLM can examine larger amounts of material at lower detection limits. While TEM did detect asbestos fibers in 3 of the bulk samples, the level was not at a high enough level (0.1%) to accurately quantify. The laboratory's professional judgment was that the sample contained <0.001% asbestos.

Application of IRIS Inhalation Unit Risk Factor and use of draft Superfund Methodology.

As previously noted, EPA is in the process of updating their asbestos quantitative risk methodology given the limitations of the IRIS model currently used and the knowledge gained since this model was implemented in 1986. The predominance of amphibole asbestos warrants consideration of use of alternative methods of toxicity assessment than the standard IRIS model [15,26]. A draft model for quantifying carcinogenic health risks associated with amphibole asbestos has been developed, although it has not been formally accepted through the EPA review process [5]. The latest peer review of the draft Superfund protocol recommended that additional analyses underpinning the document, preparation of documentation, and further review be carried out in an open and transparent manner [27]. ATSDR therefore at this time has not elected to utilize this assessment methodology.

As noted in the UIC report, use of draft Superfund methodology there is a correlation between the protocol structures and PCM structures [1]. Therefore, use of the draft Superfund

methodology would not alter conclusions about the sand castle scenario and grading the South Unit beach maintenance. However, the draft Superfund methodology would likely result in higher estimates of risk for the North Unit beach maintenance. This supports ATSDR's recommendation that beach maintenance activities be performed when the area is closed to visitors or the sand is appreciably wet.

Limitations and Uncertainties

There are acknowledged limitations and uncertainties to the above risk calculation. First, the results of the risk calculation should not be viewed as precise estimates of actual risk. As stated in the UIC report [1]:

The results of a screening assessment should *not* be viewed as an absolute quantitative estimate of risk, but as an indication of whether or not a situation should cause concern. For situations that warrant a screening approach, the general theme employed regarding estimating exposure and toxicity is to err on the side of being protective (in other words, overestimating risks) when faced with data gaps or other uncertainties in the estimates. In this way, decision makers will be presented with a result that should represent a worst-case, and even unlikely high-end, scenario. In reality, the true exposures and risks are likely to be much less than what was estimated.

As previously discussed, amphibole asbestos is thought to be more potent in regards to mesothelioma and perhaps somewhat more potent for bronchogenic carcinoma, as compared to chrysotile asbestos [15]. EPA is currently in the process of reassessing the risk assessment guidance for asbestos [11].

Child Health Considerations

ATSDR recognizes that infants and children may be more vulnerable than adults to exposure in communities faced with environmental contamination. Because children depend completely on adults for risk identification and management decisions, ATSDR is committed to evaluating their special interests.

The effects of asbestos on children are thought to be similar to the effects on adults. However, children could be especially vulnerable to asbestos exposures due to the following factors.

- Children are more likely to disturb fiber-laden soil or indoor dust while playing.
- Children are closer to the ground and thus more likely to breathe contaminated soil or dust.
- Children could be more at risk than people exposed later in life because of the long latency period between exposure and onset of asbestos-related respiratory disease.

The most at-risk children are those who would encounter asbestos in playing in soils. This issue is addressed by monitoring the sand castle building activity, and using an adjusted slope factor to account for the longer latency time for childhood exposure.

Conclusions

ATSDR used activity-based sampling scenarios to evaluate potential exposures, representing both routine recreational use and aggressive sand disturbance. The results of this sampling support the conclusion that routine recreational use of the beaches at IBSP does not pose a public health hazard. Aggressive disturbance of the beach surface by grading does result in a dispersion of asbestos fibers into the air. However, these levels of asbestos fibers do not pose an apparent public health hazard. There is, however, some uncertainty with this conclusion because of limitations in current accepted risk assessment methodology. In addition, beach grading is not conducted at IBSP with any specified frequency, and is generally conducted when beach use is at a minimum, and therefore does not represent a realistic exposure for recreational users of the park.

Recommendations

Based on these results, ATSDR recommends:

- 1) Efforts to remove ACM from the beach should be continued by IDNR.
- 2) Signs warning of asbestos contamination on the beach at IBSP should continue to be maintained. Educational materials about the contamination should continue to be made available to park visitors to help them visibly identify materials and to avoid disturbing them.
- 3) Given the low levels of potential exposure predicted and measured with direct contact with beach sands in this Exposure Investigation and previous investigations, there is no apparent reason to recommend further air sampling.
- 4) As a precaution to reduce releases during beach maintenance activities, intensive disturbances of the sand should be conducted during conditions when the sand surface is wet or when the park area being maintained is closed to the public.

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Appendix A Figures

Figure 1: Illinois Beach State Park Map

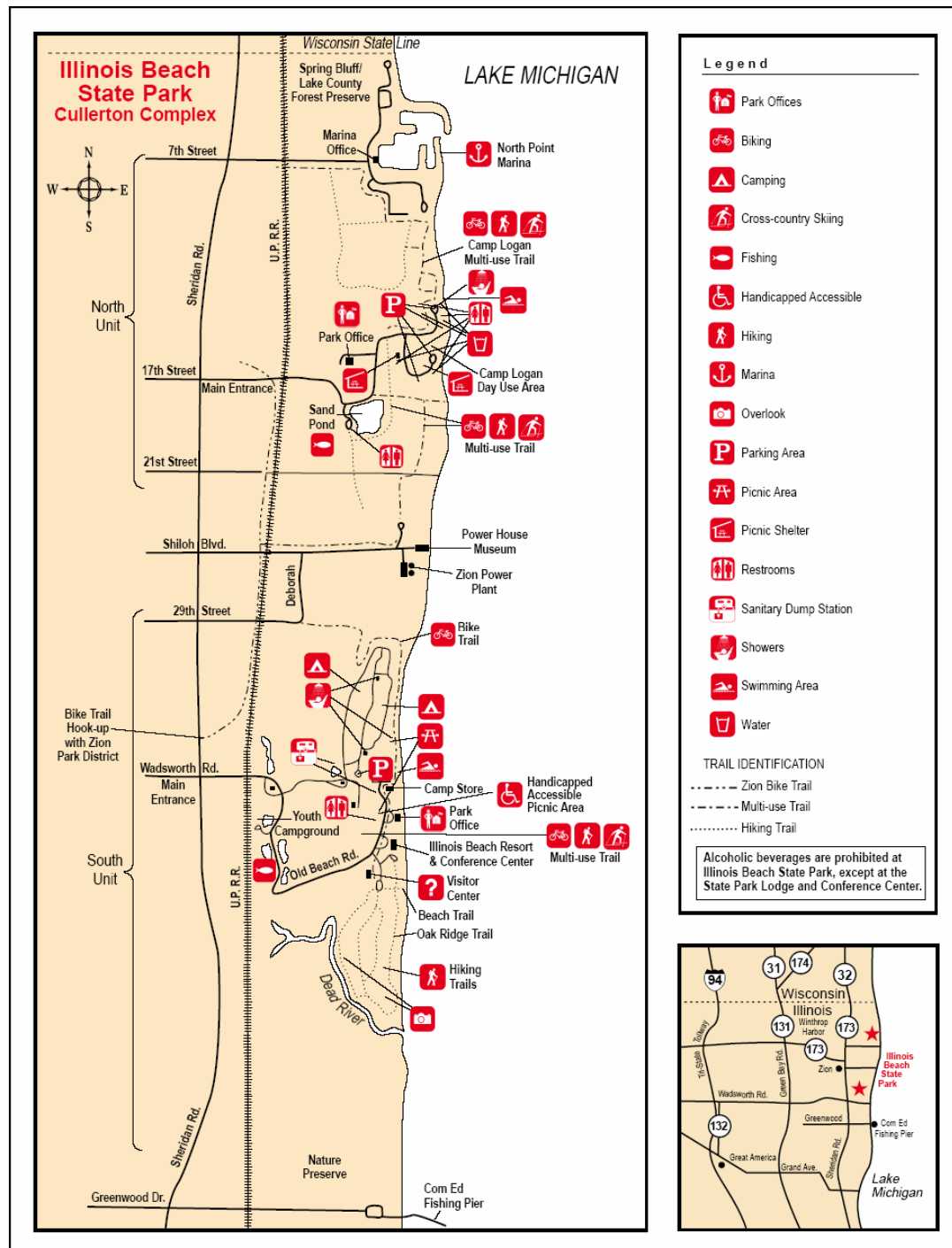


Figure 2: IBSP Shoreline Erosion

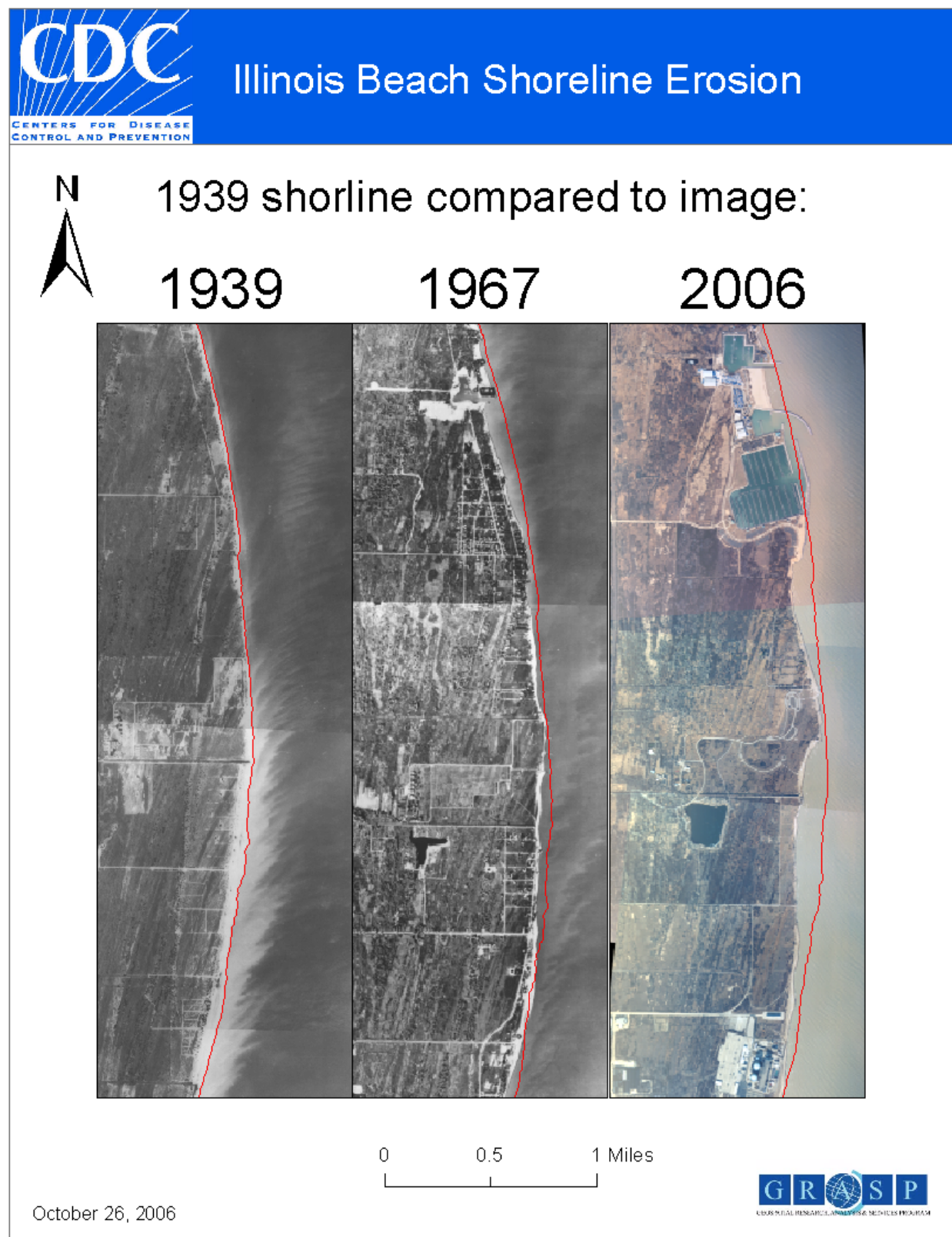


Figure 3: Houses near shoreline, IBSP

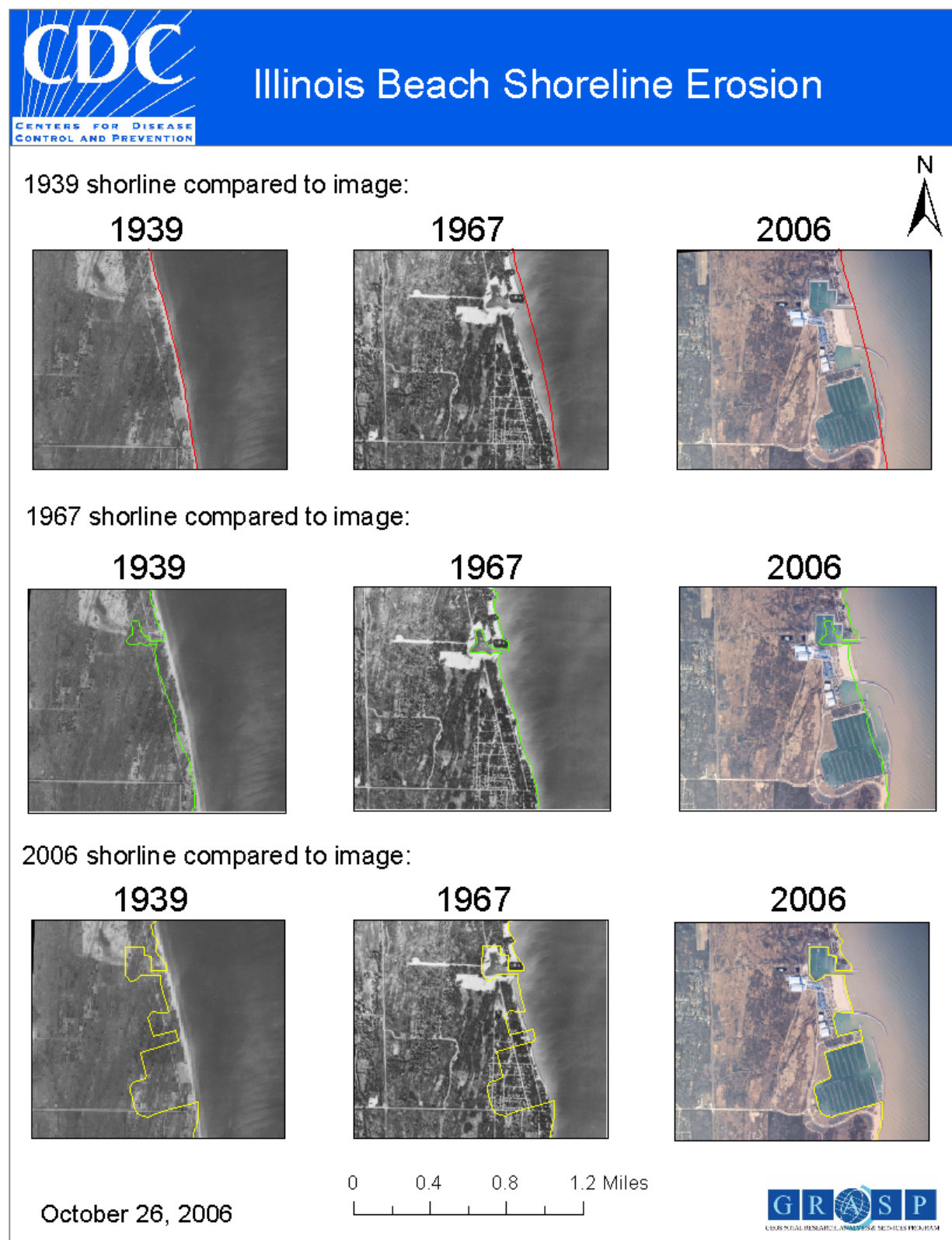


Figure 4: Suspect ACM locations, 2005.

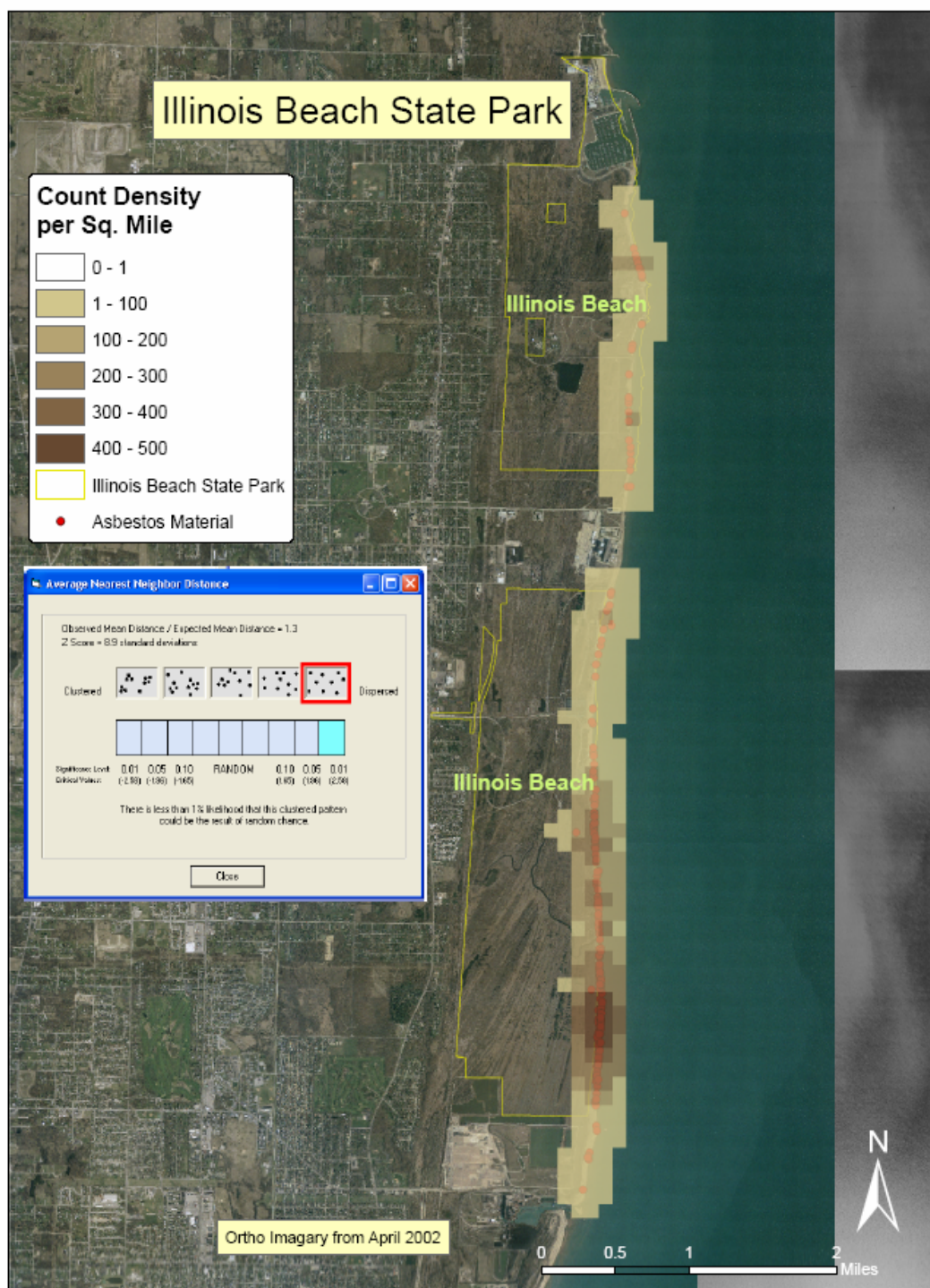
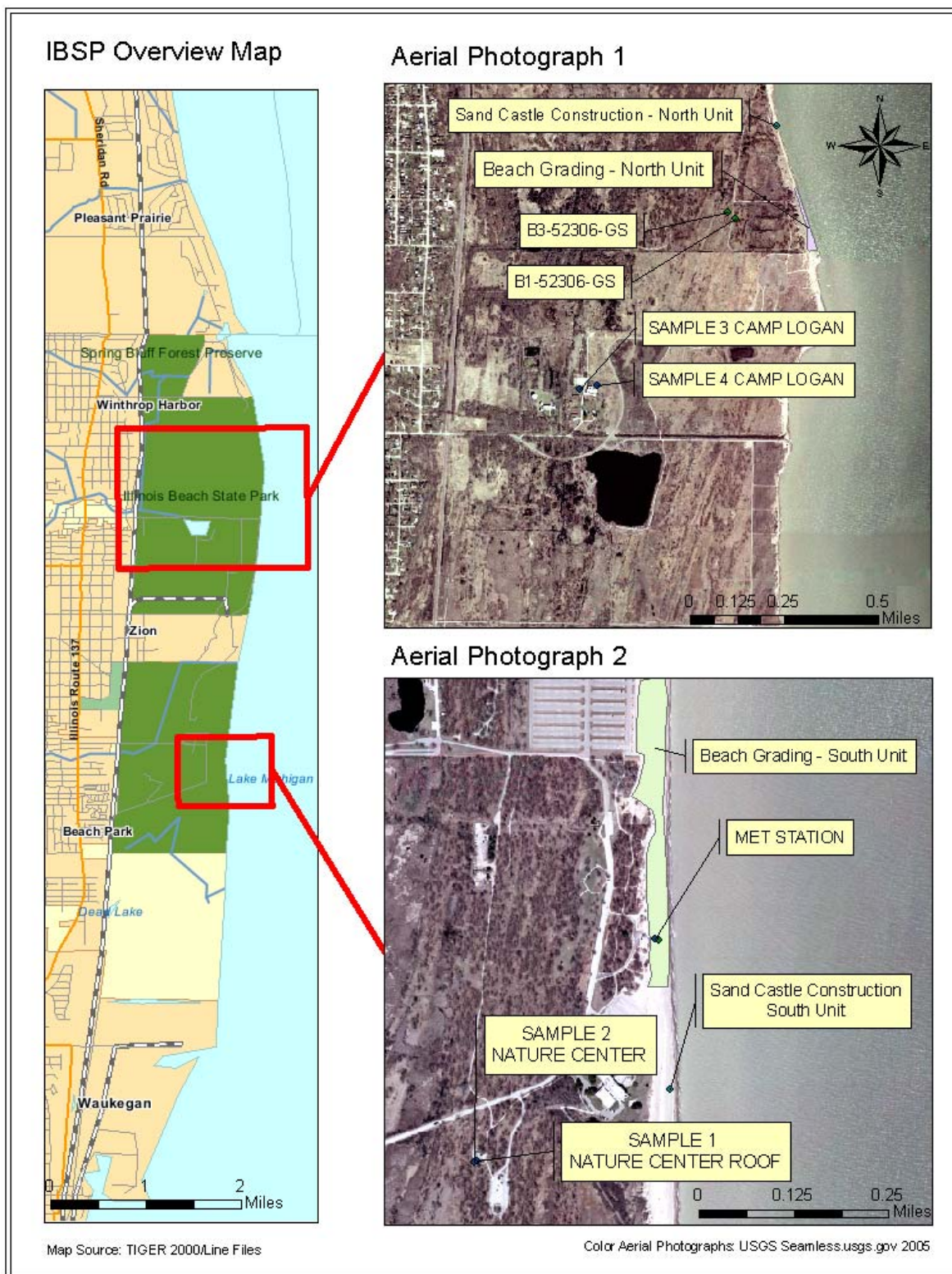


Figure 5, ATSDR EI Sample Locations.



Appendix B Tables

Table 1: Activity Based Sampling Design

<i>Case Scenario</i>	<i>Example Activities</i>	<i>Areas Monitored</i>	<i>Number of samples Collected per Area</i>	<i>Total Number of Samples Collected</i>
Sand castle *	Construction of sandcastle, digging in sand.	North Beach, South Beach	4	8
Beach Maintenance †	Persons recreating downwind of beach maintenance tasks	North Beach, South Beach	2	4
Background Samples		North Beach, South Beach	2 South Unit 5 North Unit	7

* Simulation of exposures for activities where there is direct contact with sand, such as construction of sandcastle and digging in sand

† Simulation of exposures for activities where there is more disturbance of the sand surface, such as beach maintenance

Table 2: Activity Sampling Results

<i>Sample ID</i>	<i>Activity Type</i>	<i>Air Volume (l)</i>	<i>Grid Openings counted</i>	<i>Number of Asbestos PCMe* Structures detected</i>	<i>Combined Asbestos Concentration (f/cc, PCMe, includes other amphibole asbestos)</i>
01 522306-TL	Blank	0	36	0	n/a
02 523806-TL	Blank	0	36	0	n/a
B1-52306-GS	Background – May 2006	2,935	36	0	Non-detect (<0.0004)
B3-52306-GS	Background – May 2006	2,903	36	1	<0.0027 [§] (OA)
03 523806-TL	Sand Castle	2,411	36	0	Non-detect (<0.0005)
04 523806-TL	Construction –	2,411	36	1	<0.0027 [§]
05 523806-TL	South Unit	2,411	36	0	Non-detect (<0.0005)
06 523806-TL		2,411	36	0	Non-detect (<0.0005)
07 523806-TL	Sand Castle	2,418	36	0	Non-detect (<0.0005)
08 523806-TL	Construction –	2,418	36	0	Non-detect (<0.0005)
09 523806-TL	North Unit	2,216	36	0	Non-detect (<0.0005)
10 523806-TL		2,418	36	0	Non-detect (<0.0005)
D01 523806-TL	Beach Grading – South Unit	332	252	2 (Trem/Act) 7 (OA)	<0.003 0.00036
D02 523806-TL		332	252	1 (Trem/Act) 6 (OA)	<0.002 0.00031
Sample 1	Background – August 2006	2,647	30	0	Non-detect (<0.0005)
Sample 2		2,606	30	0	Non-detect (<0.0005)
Sample 3		2,585	31	1 (Trem/Act)	<0.002
Sample 4		2,544	31	0	Non-detect (<0.0005)
Sample 5		2,504	32	0	Non-detect (<0.0005)
Sample 6	Beach Grading – North Unit	173	450	26 (OA)	0.014
Sample 7		173	450	1 (Trem/Act), 20	0.01
Sample 8		236	330	4	0.002
Sample 9		220	357	0	Non-detect (<0.0005)
Sample 10	Blank	0	33	0	n/a
Sample 11	Blank	0	33	0	n/a

* PCMe = Phase Contrast Microscopy Equivalent structures.

[§]OA = Other than amosite, crocidolite anthophyllite, tremolite, actinolite based on comparison with NIST standard spectra

[§]According to ISO 10312, when 1 to 3 structures are counted, the result shall be reported as less than the corresponding one-sided upper 95% confidence limit for the Poisson distribution (1 structure – 4.74 times the analytical sensitivity, 2 structures – 6.30 times the analytical sensitivity).

Table 3: Sand Moisture Content Analysis

<i>Location</i>	<i>% Total Solids</i>	<i>% Moisture</i>
South Unit – May 2006	98.6	1.4 J
North Unit –May 2006	99.3	0.7 J
Central office –May 2006	99.6	0.4 J
Sailing Beach – May 2006	99.6	0.4 J
North Unit – August 2006	99.9	0.1

J – Estimated. Holding times for some of the soil moisture samples were exceeded. However, the samples were held at -1.4° C until analyzed and considered to be a reasonable estimate of the moisture content.

Table 4: Risk Assessment Exposure Assumptions Variables

<i>Variable</i>	<i>Age Range</i>	<i>Typical Exposure</i>	<i>Reasonable Maximum Exposure</i>
Hours/day at exposed – sand castle building	All	2 hours	4 hours
Hours/ Day – Beach Grading	All	3 hours	4 hours
Days per year exposed – sand castle building	All	25 days/year	50 days/year
Days per year exposed - beach Grading	All	16 days/year	16 days/year
Years in Lifetime	All	70 years	70 years
Asbestos Exposure – Sand Castle Building	All	0.0008 f/cc	<0.0027 f/cc
Asbestos Exposure – Beach Grading South Unit	All	0.00034 f/cc	0.00036 f/cc
Asbestos Exposure – Beach Grading North Unit	All	0.007 f/cc	0.014 f/cc

Table 5: Estimated Average Fiber Concentration Over a 70-year Lifetime

<i>Activity</i>	<i>Lifetime Fiber Concentration (f/cc)*</i>	
	<i>Average</i>	<i>Reasonable Maximum Exposure</i>
Sand Castle Playing	4.57E-06	3.08E-05
Beach Grading South Unit	1.24E-06	1.32E-06
Beach Grading North Unit	2.56E-05	5.11E-05

$$\text{Avg fiber conc, } \left(\frac{f}{cc} \right) = \text{fiber conc for activity} \times \frac{\text{hr / day}}{24 \text{ hr / day}} \times \frac{\text{days / year}}{365 \text{ days / wk}} \times \frac{\text{yr duration}}{70 - \text{yr lifetime}}$$

Table 6: Calculated Average and Reasonable Maximum Cancer Risks

<i>Scenario</i>	<i>Inhalation Unit Risk Factor (I/(f/cc))</i>	<i>Risk at Average or Typical Exposure</i>	<i>Risk at Reasonable Maximum Exposure</i>
Sand castle building	URF = 0.23	1.05×10^{-6}	1.42×10^{-5}
Beach Grading – South Unit		4.28×10^{-7}	6.74×10^{-7}
Beach Grading – North Unit		5.88×10^{-6}	2.35×10^{-5}

Lifetime risk = average fiber conc for activity × Inhalation Unit Risk Factor

Appendix C Exposure Investigation Protocol

Exposure Investigation Protocol for Illinois Beach State Park

April 2006

A604

Prepared by

James Durant, ATSDR

Table of Contents

- I. Project overview
 - A. Summary
 - B. Investigators and collaborators
- II. Introduction
 - A. Background
 - B. Justification for the exposure investigation
 - C. Objectives
- III. Methods
 - A. Exposure investigation design
 - B. Exposure investigation population
 - C. Data collection/sampling procedures
 - D. Data analysis
 - E. Records management
 - F. Fieldwork coordination
 - G. Quality assurance
- IV. Community involvement
- V. Risk/Benefit information
- VI. Informed consent procedures
- VII. Procedures for notifying participants of individual and overall results
- VIII. Assurances of confidentiality
- IX. Estimated time frame
- X. Projected budget and source of funding
- XI. References
- XII. Appendices

I. PROJECT OVERVIEW

A. Summary

This Exposure Investigation will be conducted jointly with the Illinois Department of Natural Resources (IDNR) to examine plausible asbestos exposure to users of the Illinois Beach State Park (IBSP). Past studies of IBSP have found asbestos-containing material and asbestos fibers in beach sands, contributed by a variety of possible sources. This Exposure Investigation has been developed to address uncertainties regarding actual exposure levels to individuals who utilize the beach areas at IBSP. Historical sampling efforts include data collected in 1998 by the IDNR that was evaluated in an ATSDR Public Health Assessment authored by the Illinois Dept. of Public Health (IDPH) [1]. More recently, the University of Illinois-Chicago (UIC) School of Public Health conducted beach sampling and risk assessment at IBSP. In a review of the draft UIC report, ATSDR recommended that activity-based exposure sampling be performed at the beach to more directly evaluate the levels of asbestos exposure for recreational users at IBSP. The EI will be conducted as a collaboration between ATSDR and IDNR to evaluate that exposure.

B. Investigators and Roles

Agency for Toxic Substances and Disease Registry

Division of Health Assessment and Consultation (EICB) and Division of Regional Operations (DRO) – Region V

- EICB and DRO will assist in development of activity based sampling protocol.
- EICB will fund the ISO-10312 asbestos analysis at (Lab to be provided)
- EICB will fund analytical costs for up to \$20,000 in FY 2006. Payment of the laboratory will be arranged through EICB's mission support contractor or through inter-agency agreement with Federal Occupational Health.
- EICB will assist Illinois by providing our interpretation of the public health significance of the sampling results.
- DRO will assist in obtaining analysis of composite sand samples for moisture by the EPA Region V Labs.

Primary Contact Persons: James Durant, John Wheeler, Mark Johnson.

Illinois Department of Natural Resources

- Collection of activity based samples at Illinois Beach State Park
- Fieldwork coordination and direction of contractors retained by Illinois

Primary Contact Person: Patrick Giordano

Illinois Department of Public Health

- Provides technical input in exposure investigation protocol
- Assists with interpretation of results and long term environmental public health support for IBSP

II. INTRODUCTION

A. Background

Illinois Beach State Park consists of 6.5 miles of Lake Michigan shoreline in the city of Zion, Lake County, Illinois. It is bordered by the Wisconsin state line to the north, Lake Michigan to the east, the town of Zion to the west, and the Johns-Manville National Priorities List (NPL) hazardous waste site to the south [1]. The Park encompasses 4,160 acres of shoreline and received approximately 2.75 million visitors in 1998 [1]. Recreational activities available include camping, swimming, fishing, hiking, bicycling, and picnicking [1]. Structures within the Park boundaries include the North Point Marina, a 244-unit campground, two major public swimming areas, several inland fishing ponds, a visitor center, the Commonwealth Edison Power Plant, and the Illinois Beach Resort and Conference Center [1]. Besides seasonal tourism, the Park holds special events that draw visitors, including the In-Campground Camper Show in May and the National Jet Ski Championships in July [1]. A map of the Park is shown in Figure 1, Appendix A.

The Park is considered a natural resource with the only remaining Lake Michigan beach ridge shoreline left in the state [1]. Glacial advance and retreat created the area that left dunes, swales, marshes, and a variety of wildlife and vegetation in the area [1]. Before becoming a state park, the area was used for military training [1]. In 1948, the state of Illinois acquired the first parcels of what is now Illinois Beach State Park [1].

In late 1997, pieces of transite pipe, siding, and roofing materials suspected of containing asbestos were found scattered along the beach [1]. In February 1998, IDNR collected two bulk samples of the material and found they contained asbestos fibers. Following this discovery, IDNR began an investigation to determine the extent and possible source of asbestos contamination. Potential sources include:

- Former beachfront homes that have since washed into Lake Michigan. Much of the material found at the Park is common construction material used in the past. According to historical maps, the present lakeshore contained about 232 homes that wave action

destroyed and washed into the lake. Recent excavations also uncovered an old transite sewer line near the lodge.

- The Johns-Manville site immediately south of the Park. This plant has manufactured a variety of roofing, flooring, wall covering, and insulating materials from 1922 - 1988. The raw materials used at Johns-Manville include Portland cement, asphalt, paper, and asbestos. A 150-acre parcel of the property was used for disposal of asbestos containing material (ACM) and was placed on the NPL in 1983 [2].
- Several sources of nourishment sand have been used at the beach. Currently, IBSP requires 80,000 – 100,000 cubic yards of sand per year to prevent erosion, particularly to the North Unit beaches [1]. The tests for asbestos in the wide variety of past and potential sources of nourishment sand for IBSP has previously been reviewed [1]. In general, some of these sand sources have been visually inspected for asbestos containing materials or tested for asbestos using either polarized light microscopy or with transmission electron microscopy [1]. Asbestos was detected in some of these samples at generally low levels.
- A former rifle range in the Camp Logan area. The rifle range was built for the 1959 Pan American games and contained a large berm built with factory waste material donated by Johns-Manville. Wave action may have destroyed this berm that also potentially contained ACM.

B. Justification for the exposure investigation

In May 2000, IDPH under cooperative agreement with ATSDR, published a PHA for this site, and found that the site posed no apparent public health hazard, because air sampling data did not detect asbestos [1]. This PHA is available online at:

http://www.atsdr.cdc.gov/HAC/PHA/illinoisbeach/ibp_toc.html.

In June of 2005, ATSDR was asked by the Great Lakes Center for Excellence in Environmental Health at the University of Illinois-Chicago (UIC) School of Public Health to comment on their draft report, *Illinois State Beach Park (IBSP): Determination of Asbestos Contamination in Beach Nourishment Sand, Interim Report* [3]. The UIC study evaluated the levels of asbestos in various beach areas at IBSP, comparing the results to other beaches on the southwestern shoreline of Lake Michigan. Sample preparation and analysis was performed using the Superfund Method for the Determination of Releasable Asbestos in Soils and Bulk Materials (EPA 540-R-97-028, 1997) as modified by Draft Elutriator Method for the Determination of Asbestos in Soils and Bulk Material [4,5]. This method analyzes the abundance of asbestos structures per gram of PM10 in the sample material. Results of this study found statistically elevated levels of asbestos structures releasable from the sand in IBSP North unit sand relative to other background beaches. However, the estimated levels of asbestos exposure were significantly below the risk levels used by EPA as a threshold for taking action.

Overall, ATSDR scientists agreed with the conclusions of the risk assessment that asbestos in the beach did not appear to represent a public health hazard. However, ATSDR reviewers felt that there were some uncertainties in the exposure assessment, and recommended activity-based sampling to more directly evaluate the levels of asbestos exposure for people using the beach.

IDNR has requested the support of ATSDR in planning for an activity-based sampling effort at the IBSP. This assessment represents an opportunity for ATSDR to work collaboratively with IDNR to help address the issues raised by ATSDR review of the UIC report.

C. Objectives

The intent of this Exposure Investigation is to more directly estimate the levels of exposure and health implications of that exposure for recreational users of the beach facilities. The sampling will consist of activities with varying potential for exposure to asbestos fibers that may be present in the sand.

III. METHODS

A. Exposure investigation design

The purpose of this type of monitoring is intended to identify a potential for exposure during **specific-case scenarios** to airborne asbestos fibers at the Illinois Beach State Park. This will be accomplished by collecting personal air samples of persons mimicking activities that normally occur at the beach. Also, downwind (perimeter) samples will be collected during beach maintenance activities. The specific-case scenarios for exposure are selected to involve activities that would generate a varying degree of potential exposure due to the typical level of disturbance of the sand and the proximity to the source of sand. The specific-case scenarios planned are shown on Table 1, below.

Table 1, Specific Case Scenarios

<i>Case Scenario</i>	<i>Example Activities</i>	<i>Number of samples planned per area</i>
Sports activities	Two on two beach volleyball, playing catch, playing Frisbee.	4
Sand castle	Construction of sandcastle, digging in sand.	5
Beach Maintenance	Employees engaged in beach maintenance tasks such as using a grading or digging.	2
Beach Maintenance (perimeter)	Persons downwind of beach maintenance tasks	2

Additionally, 5 ambient air samples will be placed on the beach to determine what typical background levels will be at the beach. The cassettes will be at approximately 4 feet in height for these samples. Sample pumps for these samples will be collected with similar flow rate and duration as the case specific scenarios. These samples will be located in areas that will not be influenced by the activities being monitored.

Presumed asbestos contaminated debris are picked up on the beach by a contractor on a routine basis, and their locations fixed using a global positioning system (GPS). ATSDR plotted these locations from 2005 and examined the data using two different cluster analysis techniques,

Nearest Neighbor Analysis and Local Moran's I test. Nearest Neighbor Analysis examines the spacing of individual points across space. This test compares the observed mean distances between neighboring points with the expected mean distances based on a theoretical random pattern. As such, if the observed mean distance is greater than that of the random pattern mean distance, then the observed point pattern is considered more dispersed than the random point pattern. Conversely, if the observed mean distance is less than that of the random pattern mean distance, then the observed point pattern is considered more clustered than the random point pattern. The result of the test is a z-score, which can be compared to the standard normal distribution to determine the significance of the test. At a confidence level of 95%, a z-score would have to be less than -1.96 or greater than 1.96 to be statistically significant. A negative z-score indicates clustering while a positive z-score indicates dispersion. In this analysis, the high positive z-score of 8.9 indicates that a high degree of dispersion. Local Moran's I is a translation of a non-spatial correlation measure to a spatial context. It examines for clusters of points by identifying samples surrounded by similar samples. The cluster analysis output is an index value and a z-score for each sample. A significant positive z-score indicates the clustering of similar points near a sample. In this analysis, no samples with a significant positive z-score were found, indicating no clustering near any sample. Therefore, sampling locations will be selected randomly where possible.

Activity descriptions:

Sampling will consist of replicating activities that occur normally on IBSP. Available analysis indicate that while exposure to asbestos is possible in these activities, it is likely that even under worst case situations to be well below 1 in 1,000,000 lifetime risk range [1].

Should a relief participant be needed, the participant will stop the activity, remove the sampling equipment, and pass it to the relief participant. The original participant will assist the relief participant with donning and adjusting the backpack or belt. The exchange is anticipated to take less than 60 seconds, therefore the sampling pumps and event time clock will not be halted during the exchange. If the exchange requires more than 60 seconds, the pump and event clock will be stopped until activity is re-initiated.

1) Sandcastle building and/or digging in the sand will be performed to mimic what a child might be exposed to while playing in the sand. Five sampling locations will be selected for each 100 ft² study area (10' x 10'). Generally, it is expected that sand castle construction will occur near the surfline. Therefore, two locations will be selected randomly within 10 feet of the surfline. Three locations will be selected randomly in dryer sand away from the surf to evaluate the impact of distance from the water on fiber release. Study subjects will use typical beach sized tools and pails to disturb the sand by digging and piling the sand within the area.

The sampling period will be divided into equal sub-periods to facilitate having the participant face each compass direction for an equal amount of time during the activity. This approach is designed to mitigate the effect of wind direction on potential exposure. Random head and body movement during the activity should further mitigate the impact of wind direction on exposure. Ideally, the participants will face each compass direction at least twice during the sampling event. For example, during the four - hour or 240 -minute event, the participant might face North

for 15 minutes, rotate to the East for 15 minutes, then South for 15 minutes, then West for 15 minutes and return to the North to repeat the cycle. The participant has the option of stopping for water or rest, as needed. Rest periods longer than 1 minute will be noted.

The event participant will be fitted with a personal sampling pump; the inlet to the filter will be at a height of approximately 1 to 3 feet above the ground to simulate a child's breathing zone. The actual pump unit should be secured in a backpack or on a belt. In this activity or simulation a participant should sit on the ground while digging or scraping the top 2 to 6 inches of surface soil, placing it in a small bucket or pail and dumping it back on the ground. The activity will be paced such that soil will be placed in the bucket and dumped approximately every 2-5 minutes, regardless of the amount of material in the bucket. The bucket should be emptied rapidly from a height of approximately 12 inches.

2) The Sports activities scenario is designed to mimic aerobic activities that people may commonly engage in at the beach. A location will be randomly selected at each study area that is suitable for a 2 on 2 volleyball game. Subjects will play 2 on 2 volleyball to the extent practical. Samplers will be worn by each of the four subjects. Periodically, participants will be allowed to break from volleyball to engage in other, lower intensity activities such as playing catch, or playing with a Frisbee. Rest and water periods will be allowed as needed. Rest periods longer than 1 minute will be noted and logged.

3) Beach maintenance. According to IDNR officials, employees may engage in beach maintenance activities that involve digging and/or using a grader. These activities will be monitored and downwind samples will be collected to simulate what bystanders could be potentially exposed to.

Study areas:

1) Center Area (Illinois Beach Resort and Conference Center, Park Office and Camp Store). According to officials, this is the area that is frequented by the majority of persons who use the park for the activities simulated in this exposure investigation. Locations of the specific case scenario activities will be selected randomly, since no statistical pattern of debris found on the beaches (Figure 2). Aerosolized asbestos was detected in only 1 out of 12 elutriator samples from the UIC report [1].

2) North Point Marina Beach. This beach is located south of the North Point Marina. According to officials, this area also is frequently used for recreational activities. UIC did not sample this beach, however, bottom sands from the North Point Marina were sampled [1]. Aerosolized asbestos was detected in UIC elutriator samples of lake bottom sands of the North Point Marina 9 of 12 times [1]. This sand is dredged and fed through a slurry pipe into shallow water south of the marina [1]. Littoral transport moves this sand southward along the state park shore [1]. Locations of activities will be selected randomly at this beach.

3) North Unit Beaches. Aerosolized asbestos was found in 7 of 12 elutriator samples in the UIC report [1]. However, these beaches are more rocky and narrow as compared to the Center Area Beach [1]. However, some activity does occur in these areas (see Figure 1). Selection of

locations for the case specific scenarios will be based on the UIC data or randomly selected on beaches potentially usable for sand castle building or sports activities.

B. Exposure investigation population

The study will not be collecting samples on exposed populations. Only licensed contractors or employees working for the state of Illinois will be utilized to collect activity-based samples. They will be replicating many activities that will normally occur by beach-goers at Illinois Beach State Park.

C. Data collection/sampling procedures

Sampling procedures are outlined in the attached Project Execution Manual. This manual is attached in Appendix B.

The specific case scenarios are planned to last a minimum of 4 hours each. Locations of the activities will be referenced using a GPS. Wind speed and direction will be noted from the National Climate Data Center meteorological station at Waukegan/Chicago regional airport (WBAN #14880). If available, ATSDR will provide an on site meteorological station. To minimize the effects of increased humidity or soil moisture content, all activities will be conducted at least 24 hours after a measurable rain event.

All sampling for airborne asbestos fibers will be performed by PSI technicians licensed as Air Sampling Professionals (ASP) with the Illinois Department of Public Health. The ASP will also act as the person monitored. The ASP will engage in activities consistent with normal and typical use of the beach facilities, as outlined in Table 1.

D. Data Analysis

Analysis of filters will use the ISO 10312 method. ISO 10312 methodology uses transmission electron microscopy (TEM). ISO 10312 provides the most complete information on types and sizes of asbestos structures than any other TEM method [6]. A detection limit of 0.0005 asbestos structures/cc was selected by ATSDR for the purposes of this study. The definition of an asbestos structure is the Phase Contrast Microscopy- Equivalent (PCMe), which is a fiber > 5 microns in length, >0.25 microns in width, with an aspect ratio of 3:1. The cassettes will be archived for 6 months to allow for future additional analysis, if needed.

Because of the uncertainties of using soil data to estimate health hazards from inhalation of asbestos fibers, this protocol highly emphasizes the collection of appropriate air data through activity-based sampling. Air results will be examined with risk-models to determine the cancer risk associated with the asbestos air level. The appropriate risk model used will be determined by the mineralogy and length of the asbestos structures detected in the samples. Possible models include the EPA IRIS model, and the Berman-Crump (B-C) protocol model.

Composite sand samples (0-3" in depth) will be obtained and analyzed for moisture content. Arrangement for this will be made by ATSDR-DRO.

E. Records management

The contractor will provide IDNR with a summary report, which will include a description of sample activities documentation. Data will be provided in a matrix format indicating the sample information for each sampling event. Field data sheets, calibration logs, chains-of custody will also be provided. ATSDR will be providing IDNR with analytical results. Additionally, ATSDR will provide an Exposure Investigation Report. This report will summarize the overall sampling activity, results and the public health interpretation of the results.

F. Fieldwork Coordination

Sampling activities will be coordinated through IDNR. The protocol used is attached is Appendix B. ATSDR will also be present to collect the samples cassettes, and ship them to the designated laboratory.

G. Quality assurance

While this protocol only calls for a limited number of samples to be collected, there will be samples representing activities that have the potential to release any asbestos fibers in the sand. These data, combined with previous work at IBSP, will allow ATSDR to make a professional judgment on the public health significance of asbestos contamination at IBSP. ATSDR will delegate an ABIH Certified Industrial Hygienist (CIH) or other person qualified to observe the monitoring to ensure that monitoring protocol is executed.

To ensure that potential asbestos releases from the sand is not reduced by soil moisture, there will at least be 24 hours without measurable rain at the sampling site, as gauged by the Waukegan/Chicago regional airport.

Laboratory analysis will be arranged with a laboratory NAVLAB certified and proficient in ISO 10312 methodology.

IV. COMMUNITY INVOLVEMENT

ATSDR will provide a point person to coordinate public communication about this Exposure Investigation ATSDR's Exposure Investigation Team, IDNR, Illinois Department of Public Health, ATSDR Division of Regional Operations - Chicago, and US EPA Region 5.

V. RISK/BENEFIT INFORMATION

The benefit of doing this sampling is that it will provide Illinois and ATSDR the ability to address this existing exposure uncertainty and provide a more accurate interpretation of the public health significance of asbestos contamination at Illinois Beach State Park.

VI. INFORMED CONSENT PROCEDURES

No informed consent procedures are planned for this exposure investigation. The purpose of the exposure investigation is to collect environmental samples while contractors and employees of Illinois perform routine activities that are carried out by the visitors of IBSP on a daily basis.

VII. PROCEDURES FOR NOTIFYING PARTICIPANTS OF INDIVIDUAL AND OVERALL RESULTS

The community will be notified through ATSDR regional office, press release, and release of an Exposure Investigation Report.

VIII. ASSURANCES OF CONFIDENTIALITY

No Medical data will be collected because samples are strictly environmental.

VIII. ESTIMATED TIME FRAME

May, 2006 Collect samples

June 2006 Analysis of samples

July-August 2006 Preparation and clearance of reports

September 2006 Release of reports

IX. PROJECTED BUDGET AND SOURCE OF FUNDING

ATSDR's cost is only for laboratory sample analysis. Estimated cost is for approximately 50 samples and 10 blanks at \$400 / sample or \$24,000. The funds will be allocated from the EI section, EICB, ATSDR.

X. REFERENCES

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2. U.S. Environmental Protection Agency. Second Five Year Review Report for Johns-Manville Site, Waukegan, Lake County, Illinois. Chicago: U.S. Environmental Protection Agency Region 5; May 2003.
3. University of Illinois at Chicago. Illinois Beach State Park (IBSP): Determination of Asbestos Contamination in Beach Nourishment Sand, Interim Report of Findings, June 6, 2005.
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5. Berman DW and Kolk A. Draft Modified Elutriator Method for the Determination of Asbestos in Soils and Bulk Material. Albany, CA: Aeolus, Inc.; May 23, 2000.
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Illinois Beach State Park

Count Density per Sq. Mile

- 0 - 1
- 1 - 100
- 100 - 200
- 200 - 300
- 300 - 400
- 400 - 500
- Illinois Beach State Park
- Asbestos Material

Average Nearest Neighbor Distance

Observed Mean Distance / Expected Mean Distance = 1.3
Z Score = 8.9 standard deviations

Clustered: [Diagrams showing clustered patterns] Dispersed: [Diagram showing dispersed pattern]

Significance Level: 0.01 0.05 0.10 RANDOM 0.10 0.05 0.01
Critical Values: (-2.58) (-1.96) (-1.65) (1.65) (1.96) (2.58)

There is less than 1% likelihood that this clustered pattern could be the result of random chance.

Ortho Imagery from April 2002

0 0.5 1 2 Miles

N

Appendix B, PSI Sampling Protocol

ACTIVITY BASED ASBESTOS AIR MONITORING AIR SAMPLING PROCEEDURES

Professional Service Industries, Inc. (PSI) has been retained by the Illinois Department of Natural Resources (IDNR) under PSI Proposal No. 047-5A0106 Rev 5, dated April 28, 2006, to provide air monitoring for asbestos fibers in support of the “Exposure Investigation Protocol for Illinois Beach State Park”, dated April 2006 as prepared by the Agency for Toxic Substances and Disease Registry (ATSDR).

Provided below is a summary of sampling procedures to be performed by PSI.

1. Sample Procedure

All sampling for airborne asbestos will be performed by PSI technicians licensed as Air Sampling Professionals (ASP) with the Illinois Department of Public Health (IDPH). The ASP will engage in activities, while being monitored, as prescribed by ATSDR. These activities may include walking along the beach, reading in the sand, digging in the sand, visiting concession stands, playing catch, etc. The locations for performance of beach activities and monitoring will be selected by ATSDR.

Each sample cassette will be placed in the approximate breathing zone of the person monitored. Each sample collected will be operated for approximately four (4) hours at approximately (10) liters per minute in order to achieve an approximate sample volume of 2,400 liters.

The ASP will document the GPS location where sampling is performed, the nature of each activity and the time duration each activity is performed. PSI understands that weather information will be obtained from Waukegan Airport.

2. Sample Equipment

Sampling will be performed using personal sampling pumps and a 0.8 µm Mixed Cellulose Ester (MCE) filter cassette. Sampling will be performed using an SKC Leland Legacy personal sample pump, or equivalent.

3. Equipment Calibration

The sample equipment will be calibrated in the field prior to and at the conclusion of each test event. Calibration will be performed using a field rotometer. The rotometer will be calibrated in the laboratory against a primary standard prior to and at the conclusion of the project.

Calibration of equipment and calculation of sample volumes and flow rates will consider initial and final temperature and barometric pressure both in the field and laboratory. Sample calculations are provided below for reference.

Standardized Flow Rate

$$Q_{std} = Q_{act} \sqrt{\frac{P_c(T_s + 273)}{P_s(T_c + 273)}}$$

where:

- Q_{std} = standardized flow rate (lpm)
 Q_{act} = actual flow rate (lpm)
 P_c = average barometric pressure during flow meter calibration (inmg)
 P_s = average barometric pressure during sample (inmg)
 T_c = average temperature during flow meter calibration (°C)
 T_s = average temperature pressure during sample (°C)
 273 = conversion factor (°C to °K)

Volume

$$V = (Q_{std})(T)$$

where:

- V = volume sampled (l)
 Q_{std} = standardized flow rate (lpm)
 T = duration of sample event (min)

4. Sample Collection and Handling

Two (2) field blanks (unused filters that are taken to the field and not used) will be analyzed for every ten (10) samples collected. One (1) duplicate sample will be collected for every ten (10) samples collected. All samples will be labeled in sequential format according to the following system:

<u>001</u>	<u>01-01-05</u>	<u>SC</u>
Sample No.	Sample Date	Initials of ASP

The ASP will also document the following:

• Sample No.	• Initial Flow Rate
• Sample Date	• Final Flow Rate
• Initials of ASP	• Initial Temperature
• Start Time	• Final Temperature
• Stop Time	• Initial Barometric Pressure
• Initial Flow Rate	• Final Barometric Pressure

All samples will be shipped under chains-of-custody to ATSDR. The chains-of-custody shall include the above information, along with requested turn-around-time for sample analysis, the requested analysis, contact information and signature of the ASP.

5. Reporting

PSI will provide three (3) copies of a summary report including a description of sample activities documentation. Data will be provided in a matrix format indicating the sample information for each sampling event. Field data sheets, calibration logs and chains-of custody will also be provided.

PSI understands that analytical results will be presented separately to the IDNR by ATSDR, and therefore will not be included in the report generated by PSI. The report will not provide conclusions or risk calculations based on sample results.

6. Safety

Each individual participating in the project shall be informed of the nature of the project and its purpose as well as the nature of asbestos and the hazards associated with exposure. Results will be available for individuals participating in the study as they become available.

During the summer of 2005, PSI performed seventeen (17) separate beach investigations under PSI Project No. 047-5A086. The beach investigations included visual observation for bulk material suspected of containing asbestos. PSI personnel were monitored using personal sampling equipment during each investigation. Each sample analyzed indicated an airborne fiber count that was <0.01 f/cc.

Based on this data, it is not anticipated that the exposure level shall exceed the OSHA permissible exposure limit of 0.1 f/cc. Therefore, personal protective equipment for airborne asbestos fibers shall not be required. However, the PSI individuals participating in the project shall be informed of the concerns regarding asbestos, be appropriately trained according to Illinois Department of Public Health regulations. If the PSI individuals participating in the project request PPE, it will be provided.

The IDNR is responsible for the training, equipment and safety of its own employees.

**Amended Exposure Investigation Protocol for
Illinois Beach State Park**

August 2006

A604

Prepared by

James Durant, ATSDR

Table of Contents

- XIII. Project overview
 - A. Summary
 - B. Investigators and collaborators
- XIV. Introduction
 - A. Background
 - B. Justification for the exposure investigation
 - C. Objectives
- XV. Methods
 - A. Exposure investigation design
 - B. Exposure investigation population
 - C. Data collection/sampling procedures
 - D. Data analysis
 - E. Records management
 - F. Fieldwork coordination
 - G. Quality assurance
- XVI. Community involvement
- XVII. Risk/Benefit information
- XVIII. Informed consent procedures
- XIX. Procedures for notifying participants of individual and overall results
- XX. Assurances of confidentiality
- XXI. Estimated time frame
- XXII. Projected budget and source of funding
- XXIII. References
- XXIV. Appendices

I. PROJECT OVERVIEW

A. Summary

This Exposure Investigation will be conducted jointly with the Illinois Department of Natural Resources to examine plausible asbestos exposure to users of the Illinois Beach State Park (IBSP). Past studies of IBSP have found asbestos-containing material and asbestos fibers in beach sands, contributed by a variety of possible sources. This Exposure Investigation has been developed to address uncertainties regarding actual exposure levels to individuals who utilize the beach areas at IBSP. Historical sampling efforts include data collected in 1998 by the Illinois Department of Natural Resources that was evaluated in an ATSDR Public Health Assessment authored by the Illinois Dept. of Public Health (IDPH) [1]. More recently, the University of Illinois-Chicago (UIC) School of Public Health conducted beach sampling and risk assessment at IBSP. In a review of the draft UIC report, ATSDR recommended that activity-based exposure sampling be performed at the beach to more directly evaluate the levels of asbestos exposure for recreational users at IBSP. The EI is being conducted as a collaboration between ATSDR and Illinois Department of Natural Resources to evaluate that exposure.

An initial Exposure Investigation protocol was approved in May, 2006. Initial sampling was conducted on May 26, 2006. Sampling was stopped because of rain on May 27, 2006, which violated protocol. Samples were analyzed at MVA, Inc. laboratory in Duluth, GA (Table 1).

Table 1, EI Results, May 2006

<i>Sample ID</i>	<i>Activity Type</i>	<i>Air Volume (l)</i>	<i>Asbestos Concentration (s/cc, PCMe)*</i>	<i>Other Amphiboles</i>
01 522306-TL	Blank	0	NAD [†]	
02 523806-TL	Blank	0	NAD [†]	
03 523806-TL	Sand Castle Construction	2,411	NAD [†] (AS =0.0005)	
04 523806-TL		2,411	NAD [†] (AS =0.0005)	OA [‡] 1 structure
05 523806-TL		2,411	NAD [†] (AS =0.0005)	
06 523806-TL		2,411	NAD [†] (AS =0.0005)	
07 523806-TL		2,418	NAD [†] (AS =0.0005)	
08 523806-TL		2,418	NAD [†] (AS =0.0005)	
09 523806-TL		2,216	NAD [†] (AS =0.0005)	
10 523806-TL		2,418	NAD [†] (AS =0.0005)	
D01 523806-TL	Beach Grading	332	<0.003 Trem/Act [§]	OA [‡] 7 structures
D02 523806-TL		332	<0.002 Trem/Act [§]	OA [‡] 6 structures
B1-52306-GS	Background	2,935	NAD [†] (AS =0.0004)	
B3-52306-GS		2,903	NAD [†] (AS =0.0004)	OA [‡] 1 structure

*s/cc, PCMe= structure/cc, PCMe = Phase Contrast Microscopy Equivalent structures.

[†]NAD = No asbestos detected (chrysotile, amosite, crocidolite, anthophyllite, tremolite, actinolite). (AS = Analytical Sensitivity)

[‡]OA = Other Amphibole present in sample Other than amosite, crocidolite anthophyllite, tremolite, actinolite based on comparison with NIST standard spectra

[§]According to ISO 10312, when 1 to 3 structures are counted, the result shall be reported as less than the corresponding one-sided upper 95% confidence limit for the Poisson distribution (1 structure – 4.74 times the analytical sensitivity, 2 structures – 6.30 times the analytical sensitivity).

Based on the analytic results and field experiences of this sampling event, the Exposure Investigation protocol was modified for the remaining samples in the following manner (sampling planned for August, 2006):

1. Elimination of sports activity scenario because sand castle building scenario results did not detect airborne asbestos above background. Additionally, higher volume personal sampling pumps that were proposed in the original protocol failed to obtain the required 10 liters per minute (lpm) flow rate required to collect the 2,400 liter air sample. Use of stationary sampling pumps is not feasible for this activity.
2. Because of the failure of the battery powered high volume personal samplers to obtain the required flow rate, standard personal sampling pumps will be used at 4 lpm to collect approximately 350 liters of air during the beach grading activity scenario. To obtain the analytical sensitivity of 0.0005 structures per cubic centimeter (s/cc), the laboratory will count 7 times the number of grid openings as previously proposed.
3. Because of the failure of the battery powered high volume personal samplers in the field, AC powered sampling pumps will be used to collect background samples.
4. Eliminate performing sand castle building at a third beach area because results are likely to be non-detect because previous sampling did not detect asbestos above background.

B. Investigators and Roles

Agency for Toxic Substances and Disease Registry

Division of Health Assessment and Consultation (EICB) and Division of Regional Operations (DRO) – Region V

- EICB and DRO will assist in development of activity based sampling protocol.
- EICB will fund the ISO-10312 asbestos analysis.
- EICB will fund analytical costs for up to approximately \$26,400 in FY 2006. Payment of the laboratory will be arranged through EICB's mission support contractor or through inter-agency agreement with Federal Occupational Health.
- EICB will assist Illinois by providing our interpretation of the public health significance of the sampling results.
- DRO will assist in obtaining analysis of composite sand samples for moisture by the EPA Region V Labs.

Primary Contact Persons: James Durant, John Wheeler, Mark Johnson.

Illinois Department of Natural Resources

- Collection of activity based samples at Illinois Beach State Park
- Fieldwork coordination and direction of contractors retained by Illinois

Primary Contact Person: Patrick Giordano

Illinois Department of Public Health

- Provides technical input in exposure investigation protocol
- Assists with interpretation of results and long term environmental public health support for IBSP

II. INTRODUCTION

A. Background

Illinois Beach State Park consists of 6.5 miles of Lake Michigan shoreline in the city of Zion, Lake County, Illinois. It is bordered by the Wisconsin state line to the north, Lake Michigan to the east, the town of Zion to the west, and the Johns-Manville National Priorities List (NPL) hazardous waste site to the south [1]. The Park encompasses 4,160 acres of shoreline and received approximately 2.75 million visitors in 1998 [1]. Recreational activities available include camping, swimming, fishing, hiking, bicycling, and picnicking [1]. Structures within the Park boundaries include the North Point Marina, a 244-unit campground, two major public swimming areas, several inland fishing ponds, a visitor center, the Commonwealth Edison Power Plant, and the Illinois Beach Resort and Conference Center [1]. Besides seasonal tourism, the Park holds special events that draw visitors, including the In-Campground Camper Show in May and the National Jet Ski Championships in July [1]. A map of the Park is shown in Figure 1, Appendix A.

The Park is considered a natural resource with the only remaining Lake Michigan beach ridge shoreline left in the state [1]. Glacial advance and retreat created the area that left dunes, swales, marshes, and a variety of wildlife and vegetation in the area [1]. Before becoming a state park, the area was used for military training [1]. In 1948, the state of Illinois acquired the first parcels of what is now Illinois Beach State Park [1].

In late 1997, pieces of transite pipe, siding, and roofing materials suspected of containing asbestos were found scattered along the beach [1]. In February 1998, Illinois Department of Natural Resources collected two bulk samples of the material and found they contained asbestos

fibers. Following this discovery, Illinois Department of Natural Resources began an investigation to determine the extent and possible source of asbestos contamination. Potential sources include:

- Former beachfront homes that have since washed into Lake Michigan. Much of the material found at the Park is common construction material used in the past. According to historical maps, the present lakeshore contained about 232 homes that wave action destroyed and washed into the lake. Recent excavations also uncovered an old transite sewer line near the lodge.
- The Johns-Manville site immediately south of the Park. This plant manufactured a variety of roofing, flooring, wall covering, and insulating materials from 1922 - 1988. The raw materials used at Johns-Manville include Portland cement, asphalt, paper, and asbestos. A 150-acre parcel of the property was used for disposal of asbestos containing material (ACM) and was placed on the NPL in 1983 [2].
- Several sources of nourishment sand have been used at the beach. Currently, IBSP requires 80,000 – 100,000 cubic yards of sand per year to prevent erosion, particularly to the North Unit beaches [1]. The tests for asbestos in the wide variety of past and potential sources of nourishment sand for IBSP has previously been reviewed [1]. In general, some of these sand sources have been visually inspected for asbestos containing materials or tested for asbestos using either polarized light microscopy or with transmission electron microscopy [1]. Asbestos was detected in some of these samples at generally low levels.
- A former rifle range in the Camp Logan area. The rifle range was built for the 1959 Pan American games and contained a large berm built with factory waste material donated by Johns-Manville. Wave action may have destroyed this berm that also potentially contained ACM.

B. Justification for the exposure investigation

In May 2000, IDPH under cooperative agreement with ATSDR, published a PHA for this site, and found that the site posed no apparent public health hazard, because air sampling data did not detect asbestos [1]. This PHA is available online at:

http://www.atsdr.cdc.gov/HAC/PHA/illinoisbeach/ibp_toc.html.

In June of 2005, ATSDR was asked by the Great Lakes Center for Excellence in Environmental Health at the University of Illinois-Chicago (UIC) School of Public Health to comment on their draft report, *Illinois State Beach Park (IBSP): Determination of Asbestos Contamination in Beach Nourishment Sand, Interim Report* [3]. The UIC study evaluated the levels of asbestos in various beach areas at IBSP, comparing the results to other beaches on the southwestern shoreline of Lake Michigan. Sample preparation and analysis was performed using the Superfund Method for the Determination of Releasable Asbestos in Soils and Bulk Materials (EPA 540-R-97-028, 1997) as modified by Draft Elutriator Method for the Determination of Asbestos in Soils and Bulk Material [4,5]. This method analyzes the abundance of asbestos structures per gram of PM10 in the sample material. Results of this study found statistically elevated levels of asbestos structures releasable from the sand in IBSP North unit sand relative to other background beaches. However, the estimated levels of asbestos exposure were significantly below the risk levels used by EPA as a threshold for taking action.

Overall, ATSDR scientists agreed with the conclusions of the risk assessment that asbestos in the beach did not appear to represent a public health hazard. However, ATSDR reviewers felt that there were some uncertainties in the exposure assessment, and recommended activity-based sampling to more directly evaluate the levels of asbestos exposure for people using the beach.

Illinois Department of Natural Resources has requested the support of ATSDR in planning for an activity-based sampling effort at the IBSP. This assessment represents an opportunity for ATSDR to work collaboratively with the State of Illinois, Illinois Department of Natural Resources and the Illinois Department of Public Health to help address the issues raised by ATSDR review of the UIC report.

C. Objectives

The intent of this Exposure Investigation is to more directly estimate the levels of exposure and health implications of that exposure for recreational users of the beach facilities. The sampling will consist of activities with varying potential for exposure to asbestos fibers that may be present in the sand.

D. Previous Sampling Results

Contractors for DNR collected air sampling of sand castle building

III. METHODS

A. Exposure investigation design

The purpose of this type of monitoring is intended to identify a potential for exposure during **specific-case scenarios** to airborne asbestos fibers at the Illinois Beach State Park. This will be accomplished by collecting personal air samples of persons mimicking activities that normally occur at the beach. The specific-case scenarios for exposure are selected to involve activities that would generate a varying degree of potential exposure due to the typical level of disturbance of the sand and the proximity to the source of sand. The specific-case scenarios planned are shown on Table 2, below. Additionally, the samples will be collected during periods when the park is closed (after 8 PM). IDNR Police will provide security to ensure that unauthorized persons will not be on the beach during testing.

Table 2, Specific Case Scenarios

<i>Case Scenario</i>	<i>Example Activities</i>	<i>Number of samples planned per area</i>
Sand Castle Building (North Beach and South Beach)	Construction of sandcastle, digging in sand.	4
Beach Maintenance	Dragging of grading over beach	2

Additionally, 5 ambient air samples will be collected on the beach to determine what typical background levels will be at the beach. The cassettes will be at approximately 4 feet in height for these samples. Sample pumps for these samples will be collected with similar flow rate and duration as the case specific scenarios. These samples will be located in areas that will not be influenced by the activities being monitored.

Presumed asbestos contaminated debris are picked up on the beach by a contractor on a routine basis, and their locations fixed using a global positioning system (GPS). ATSDR plotted these locations from 2005 and examined the data using two different cluster analysis techniques, Nearest Neighbor Analysis and Local Moran's I test. Nearest Neighbor Analysis examines the spacing of individual points across space. This test compares the observed mean distances between neighboring points with the expected mean distances based on a theoretical random pattern. As such, if the observed mean distance is greater than that of the random pattern mean distance, then the observed point pattern is considered more dispersed than the random point pattern. Conversely, if the observed mean distance is less than that of the random pattern mean distance, then the observed point pattern is considered more clustered than the random point pattern. The result of the test is a z-score, which can be compared to the standard normal distribution to determine the significance of the test. At a confidence level of 95%, a z-score would have to be less than -1.96 or greater than 1.96 to be statistically significant. A negative z-score indicates clustering while a positive z-score indicates dispersion. In this analysis, the high positive z-score of 8.9 indicates that a high degree of dispersion. Local Moran's I is a translation of a non-spatial correlation measure to a spatial context. It examines for clusters of points by identifying samples surrounded by similar samples. The cluster analysis output is an index value and a z-score for each sample. A significant positive z-score indicates the clustering of similar points near a sample. In the analysis of IBSP debris, no samples with a significant positive z-score were found, indicating no clustering near any sample. The UIC study examined aerosilizable asbestos content in IBSP sands. Therefore, sampling locations will be selected in areas where the UIC study detected aerosilizable asbestos.

Activity descriptions:

Available analysis indicate that while exposure to asbestos is possible in these activities, it is likely that even under worst case situations to be well below 1 in 1,000,000 lifetime risk range [1].

Should a relief participant be needed, the participant will stop the activity, remove the sampling equipment, and pass it to the relief participant. The original participant will assist the relief participant with donning and adjusting the backpack or belt. The exchange is anticipated to take less than 60 seconds, therefore the sampling pumps and event time clock will not be halted during the exchange. If the exchange requires more than 60 seconds, the pump and event clock will be stopped until activity is re-initiated.

1) Sandcastle building and/or digging in the sand will be performed to mimic what a child might be exposed to while playing in the sand. Five sampling locations will be selected for each 100 ft² study area (10' x 10'). Generally, it is expected that sand castle construction will occur near the surfline. Therefore, two locations will be selected randomly within 10 feet of the surfline. Three

locations will be selected randomly in dryer sand away from the surf to evaluate the impact of distance from the water on fiber release. Study subjects will use typical beach sized tools and pails to disturb the sand by digging and piling the sand within the area.

The sampling period will be divided into equal sub-periods to facilitate having the participant face each compass direction for an equal amount of time during the activity. This approach is designed to mitigate the effect of wind direction on potential exposure. Random head and body movement during the activity should further mitigate the impact of wind direction on exposure. Ideally, the participants will face each compass direction at least twice during the sampling event. For example, during the four - hour or 240 -minute event, the participant might face North for 15 minutes, rotate to the East for 15 minutes, then South for 15 minutes, then West for 15 minutes and return to the North to repeat the cycle. The participant has the option of stopping for water or rest, as needed. Rest periods longer than 1 minute will be noted.

The event participant will be fitted with a personal sampling pump; the inlet to the filter will be at a height of approximately 1 to 3 feet above the ground to simulate a child's breathing zone. The actual pump unit will be placed near the participant and a long hose used to connect the pump to the sample filter. In this activity or simulation a participant should sit on the ground while digging or scraping the top 2 to 6 inches of surface soil, placing it in a small bucket or pail and dumping it back on the ground. The activity will be paced such that soil will be placed in the bucket and dumped approximately every 2-5 minutes, regardless of the amount of material in the bucket. The bucket should be emptied rapidly from a height of approximately 12 inches.

2) Beach maintenance. According to Illinois Department of Natural Resources officials, employees may engage in beach maintenance activities that involve using a grader. These activities will be monitored to simulate what bystanders could be potentially exposed to. For this monitoring, sampling pumps will be used to collect air samples on the grader, with samplers located at approximately four feet in height. Four duplicate samples will be collected simultaneously. Two samplers will be collected at 3 liters per minute (lpm), and 2 will be collected at 4 lpm. The laboratory will be instructed to analyze the 4 lpm. The 3 lpm samples will be archived and saved in case the 4 lpm samples are overloaded.

Study areas:

1) Center Area (Illinois Beach Resort and Conference Center, Park Office and Camp Store). According to officials, this is the area that is frequented by the majority of persons who use the park for the activities simulated in this exposure investigation. Locations of the specific case scenario activities will be selected randomly, since no statistical pattern of debris found on the beaches (Figure 2). Aerosolized asbestos was detected in only 1 out of 12 elutriator samples from the UIC report [1].

2) North Point Marina Beach. This beach is located south of the North Point Marina. According to officials, this area also is frequently used for recreational activities. UIC did not sample this beach, however, bottom sands from the North Point Marina were sampled [1]. Aerosolized asbestos was detected in UIC elutriator samples of lake bottom sands of the North Point Marina 9 of 12 times [1]. This sand is dredged and fed through a slurry pipe into shallow water south of

the marina [1]. Littoral transport moves this sand southward along the state park shore [1]. Locations of activities will be selected randomly at this beach.

3) North Unit Beaches. Aerosolized asbestos was found in 7 of 12 ellutriator samples in the UIC report [1]. However, these beaches are more rocky and narrow as compared to the Center Area Beach [1]. However, some recreational activity does occur in these areas (see Figure 1). Selection of locations for the case specific scenarios will be based on the UIC data or randomly selected on beaches potentially usable for sand castle building or sports activities.

B. Exposure investigation population

The study will not be collecting samples on exposed populations. Only licensed contractors or employees working for the state of Illinois will be utilized to collect activity-based samples. They will be replicating many activities that will normally occur by beach-goers at Illinois Beach State Park.

C. Data collection/sampling procedures

Sampling procedures are outlined in the attached Project Execution Manual. This manual is attached in Appendix B.

The specific case scenarios are planned to last a minimum of 4 hours each. Locations of the activities will be referenced using a GPS. Wind speed and direction will be noted from the National Climate Data Center meteorological station at Waukegan/Chicago regional airport (WBAN #14880). ATSDR will provide an on site meteorological station. To minimize the effects of increased humidity or soil moisture content, all activities will be conducted at least 24 hours after a measurable rain event.

All sampling for airborne asbestos fibers will be performed by PSI technicians licensed as Air Sampling Professionals (ASP) with the Illinois Department of Public Health. The ASP will also act as a person monitored. The monitored personnel will engage in activities consistent with normal and typical use of the beach facilities, as outlined in Table 1.

D. Data Analysis

Analysis of filters will use the ISO 10312 method. ISO 10312 methodology uses transmission electron microscopy (TEM). ISO 10312 provides the most complete information on types and sizes of asbestos structures than any other TEM method [6]. A detection limit of 0.0005 asbestos structures/cc was selected by ATSDR for the purposes of this study. The definition of an asbestos structure is the Phase Contrast Microscopy- Equivalent (PCMe), which is a fiber > 5 microns in length, >0.25 microns in width, with an aspect ratio of 3:1. The cassettes will be archived for 6 months to allow for future additional analysis, if needed.

Because of the uncertainties of using soil data to estimate health hazards from inhalation of asbestos fibers, this protocol focuses on the collection of appropriate air data through activity-based sampling. Air results will be examined with risk-models to determine the cancer risk associated with the asbestos air level. The appropriate risk model used will be determined by the

mineralogy and length of the asbestos structures detected in the samples. Possible models include the EPA IRIS model, and the Berman-Crump (B-C) protocol model.

Composite sand samples (0-3” in depth) will be obtained and analyzed for moisture content. Arrangement for this will be made by ATSDR-DRO.

E. Records management

The contractor will provide Illinois Department of Natural Resources with a summary report, which will include a description of sample activities documentation. Data will be provided in a matrix format indicating the sample information for each sampling event. Field data sheets, calibration logs, chains-of custody will also be provided. ATSDR will be providing Illinois Department of Natural Resources with analytical results. Additionally, ATSDR will provide an Exposure Investigation Report. This report will summarize the overall sampling activity, results and the public health interpretation of the results.

F. Fieldwork Coordination

Sampling activities will be coordinated by Illinois Department of Natural Resources. The protocol used is attached is Appendix B. ATSDR will also be present to collect the sample cassettes, and ship them to the designated laboratory.

G. Quality assurance

While this protocol only calls for a limited number of samples to be collected, the samples represent activities that have the potential to release any asbestos fibers in the sand. These data, combined with previous work at IBSP, will allow ATSDR to make a professional judgment on the public health significance of asbestos contamination at IBSP. ATSDR will delegate an ABIH Certified Industrial Hygienist (CIH) or other person qualified to observe the monitoring to ensure that monitoring protocol is executed.

To ensure that potential asbestos releases from the sand is not reduced by soil moisture, samples will not be collected unless there is at least a 24 hour period without a measurable rain at the sampling site, as gauged by the Waukegan/Chicago regional airport.

Laboratory analysis will be arranged with a laboratory NAVLAB certified and proficient in ISO 10312 methodology.

IV. COMMUNITY INVOLVEMENT

Communications about this Exposure Investigation will be coordinated between ATSDR's Exposure Investigation Team, Illinois Department of Natural Resources, IDPH, ATSDR Division of Regional Operations - Chicago, and US EPA Region 5.

V. RISK/BENEFIT INFORMATION

The benefit of doing this sampling is that it will provide Illinois and ATSDR the ability to address this existing exposure uncertainty and provide a more accurate interpretation of the public health significance of asbestos contamination at Illinois Beach State Park.

VI. INFORMED CONSENT PROCEDURES

No informed consent procedures are planned for this exposure investigation. The purpose of the exposure investigation is to collect environmental samples while contractors and employees of Illinois perform routine activities that are carried out by the visitors of IBSP on a daily basis.

VII. PROCEDURES FOR NOTIFYING PARTICIPANTS OF INDIVIDUAL AND OVERALL RESULTS

The community will be notified through ATSDR regional office, press release, and release of an Exposure Investigation Report.

VIII. ASSURANCES OF CONFIDENTIALITY

No Medical data will be collected because samples are strictly environmental.

VIII. ESTIMATED TIME FRAME

May, August 2006 Collect samples
June, September 2006 Analysis of samples
September-November 2006 Preparation and clearance of reports
November-December 2006 Release of reports

IX. PROJECTED BUDGET AND SOURCE OF FUNDING

ATSDR's cost is only for laboratory sample analysis. Estimated cost is for approximately 50 samples and 10 blanks at \$400 / sample or \$24,000. The analysis of the four bulk samples of sand by PLM and TEM will be \$600 / samples or \$2,400. The funds will be allocated from the EI section, EICB, ATSDR.

X. REFERENCES

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2. U.S. Environmental Protection Agency. Second Five Year Review Report for Johns-Manville Site, Waukegan, Lake County, Illinois. Chicago: U.S. Environmental Protection Agency Region 5; May 2003.
3. University of Illinois at Chicago. Illinois Beach State Park (IBSP): Determination of Asbestos Contamination in Beach Nourishment Sand, Interim Report of Findings, June 6, 2005.
4. U.S. Environmental Protection Agency. Superfund Method for the Determination of Releasable Asbestos in Soils and Bulk Materials. EPA 540-R-97-028. Washington D.C. ;1997
5. Berman DW and Kolk A. Draft Modified Elutriator Method for the Determination of Asbestos in Soils and Bulk Material. Albany, CA: Aeolus, Inc.; May 23, 2000.
6. Millette, JR, Boltin R, Bandli. Notes on the Fundamentals of Asbestos Analysis by Light and Electron Microscopy. Norcross, GA: MVA Inc., 2003, August.

XI. APPENDICES

Appendix A - Figures

Figure 1, Illinois Beach State Park Map (from <http://dnr.state.il.us/lands/Landmgt/PDF%27s/illinoisbeach.pdf>)

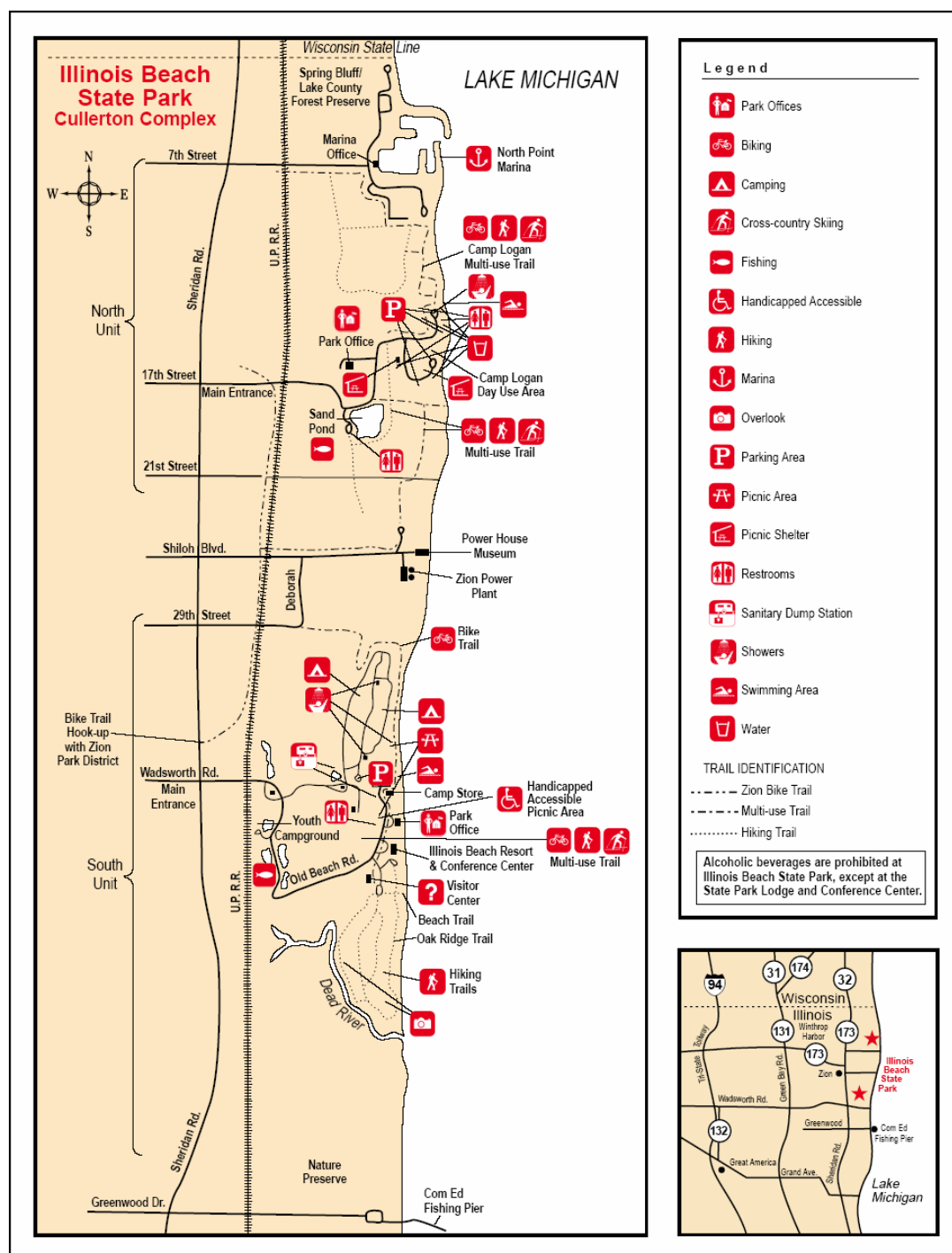
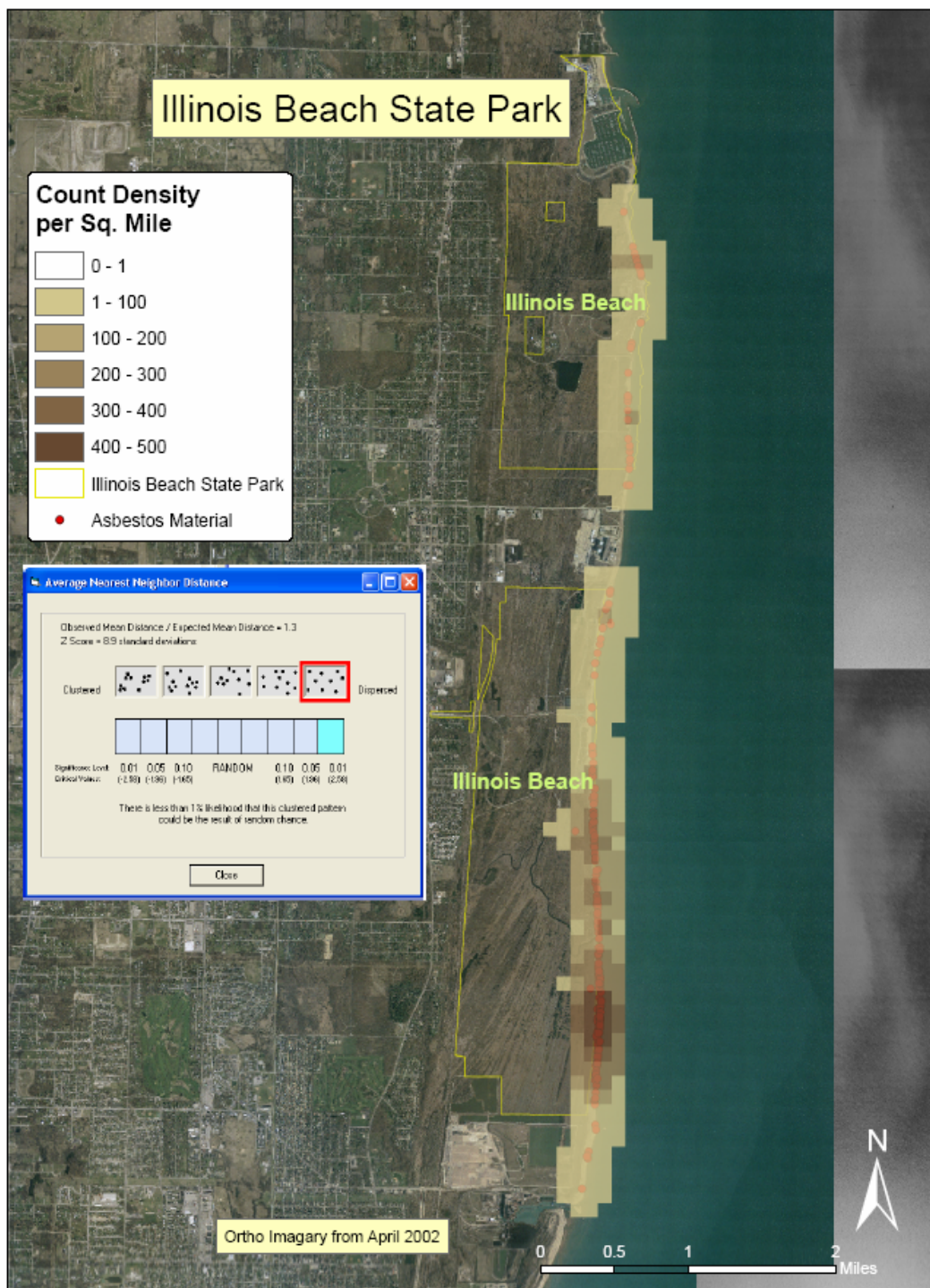


Figure 2, Cluster Analysis of Debris at IBSP



Appendix B, PSI Sampling Protocol

ACTIVITY BASED ASBESTOS AIR MONITORING AIR SAMPLING PROCEEDURES

Professional Service Industries, Inc. (PSI) has been retained by the Illinois Department of Natural Resources under PSI Proposal No. 047-5A0106 Rev 5, dated April 28, 2006, to provide air monitoring for asbestos fibers in support of the “Exposure Investigation Protocol for Illinois Beach State Park”, dated April 2006 as prepared by the Agency for Toxic Substances and Disease Registry (ATSDR).

Provided below is a summary of sampling procedures to be performed by PSI.

1. Sample Procedure

All sampling for airborne asbestos will be performed by PSI technicians licensed as Air Sampling Professionals (ASP) with the Illinois Department of Public Health (IDPH). The ASP will engage in activities, while being monitored, as prescribed by ATSDR. These activities may include walking along the beach, reading in the sand, digging in the sand, visiting concession stands, playing catch, etc. The locations for performance of beach activities and monitoring will be selected by ATSDR.

Each sample cassette will be placed in the approximate breathing zone of the person monitored. Each sample collected will be operated for approximately four (4) hours at approximately (10) liters per minute in order to achieve an approximate sample volume of 2,400 liters.

The ASP will document the GPS location where sampling is performed, the nature of each activity and the time duration each activity is performed. PSI understands that weather information will be obtained from Waukegan Airport.

2. Sample Equipment

Sampling will be performed using personal sampling pumps and a 0.8 μ m Mixed Cellulose Ester (MCE) filter cassette. Sampling will be performed using an SKC Leland Legacy personal sample pump, or equivalent.

3. Equipment Calibration

The sample equipment will be calibrated in the field prior to and at the conclusion of each test event. Calibration will be performed using a field rotometer. The rotometer will be calibrated in the laboratory against a primary standard prior to and at the conclusion of the project.

Calibration of equipment and calculation of sample volumes and flow rates will consider initial and final temperature and barometric pressure both in the field and laboratory. Sample calculations are provided below for reference.

Standardized Flow Rate

$$Q_{std} = Q_{act} \sqrt{\frac{P_c(T_s + 273)}{P_s(T_c + 273)}}$$

where:

- Q_{std} = standardized flow rate (lpm)
- Q_{act} = actual flow rate (lpm)
- P_c = average barometric pressure during flow meter calibration (inmg)
- P_s = average barometric pressure during sample (inmg)
- T_c = average temperature during flow meter calibration (°C)
- T_s = average temperature pressure during sample (°C)
- 273 = conversion factor (°C to °K)

Volume

$$V = (Q_{std})(T)$$

where:

- V = volume sampled (l)
- Q_{std} = standardized flow rate (lpm)
- T = duration of sample event (min)

4. Sample Collection and Handling

Two (2) field blanks (unused filters that are taken to the field and not used) will be analyzed for every ten (10) samples collected. One (1) duplicate sample will be collected for every ten (10) samples collected. All samples will be labeled in sequential format according to the following system:

<u>001</u>	<u>01-01-05</u>	<u>SC</u>
Sample No.	Sample Date	Initials of ASP

The ASP will also document the following:

• Sample No.	• Initial Flow Rate
• Sample Date	• Final Flow Rate
• Initials of ASP	• Initial Temperature
• Start Time	• Final Temperature
• Stop Time	• Initial Barometric Pressure
• Initial Flow Rate	• Final Barometric Pressure

All samples will be shipped under chains-of-custody to ATSDR. The chains-of-custody shall include the above information, along with requested turn-around-time for sample analysis, the requested analysis, contact information and signature of the ASP.

5. Reporting

PSI will provide three (3) copies of a summary report including a description of sample activities documentation. Data will be provided in a matrix format indicating the sample information for each sampling event. Field data sheets, calibration logs and chains-of custody will also be provided.

PSI understands that analytical results will be presented separately to the Illinois Department of Natural Resources by ATSDR, and therefore will not be included in the report generated by PSI. The report will not provide conclusions or risk calculations based on sample results.

6. Safety

Each individual participating in the project shall be informed of the nature of the project and its purpose as well as the nature of asbestos and the hazards associated with exposure. Results will be available for individuals participating in the study as they become available.

During the summer of 2005, PSI performed seventeen (17) separate beach investigations under PSI Project No. 047-5A086. The beach investigations included visual observation for bulk material suspected of containing asbestos. PSI personnel were monitored using personal sampling equipment during each investigation. Each sample analyzed indicated an airborne fiber count that was <0.01 f/cc.

Based on this data, it is not anticipated that the exposure level shall exceed the OSHA permissible exposure limit of 0.1 f/cc. Therefore, personal protective equipment for airborne asbestos fibers shall not be required. However, the PSI individuals participating in the project shall be informed of the concerns regarding asbestos, be appropriately trained according to Illinois Department of Public Health regulations. If the PSI individuals participating in the project request PPE, it will be provided.

Illinois Department of Natural Resources is responsible for the training, equipment and safety of its own employees.