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Environmental & Engineering Excellence
from Concept to Completion

LSRP-Expert Report
Regarding
Environmental Issues

University Medical Center at Princeton
253 Witherspoon Street
Princeton, New Jersey

Prepared For
Municipality of Princeton, New Jersey
March 2014

Prepared By

Ira L. Whitman, P.E., Ph.D., LSRP

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March 4, 2014

Robert V. Kiser, P.E.
Municipal Engineer
Municipality of Princeton
400 Witherspoon Street
Princeton, New Jersey 08540

RE: LSRP – Expert Report
University Medical Center at Princeton
235 Witherspoon Street
Princeton, New Jersey
Whitman Project # 14-01-14T

Dear Mr. Kiser

I am pleased to transmit to you my final LSRP – Expert Report regarding environmental issues at the University Medical Center at Princeton, 253 Witherspoon Street.

The final report reflects my discussions with you and your staff, the meeting on February 24, 2014 with municipal officials, including yourself, representatives of Avalon Bay, and their environmental consultants, Ecol Sciences. That meeting also extended to a visit to the hospital site to determine suitable locations for soil sampling.

I plan to be present at the Council meeting on March 10, 2014, 7 PM to answer questions and discuss my findings and recommendations regarding the environmental issues at the hospital site.

Please contact me if you have any questions or comments regarding the attached report.

Very truly yours,

Ira L Whitman

Ira L. Whitman, P.E., LSRP
Principal

cc: John M. West, P.E., P.P., Land Use Engineer

LSRP-EXPERT REPORT
REGARDING
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EXECUTIVE SUMMARY

Dr. Ira L. Whitman, P.E., LSRP was engaged by the Municipality of Princeton to independently evaluate environmental issues at Princeton Hospital associated with the medical waste incinerator, and with demolition of existing structures as the site is redeveloped into a multi-unit rental apartment complex. The primary findings and recommendations from this assessment include:

- The Medical Center at Princeton is not subject to New Jersey's Industrial Site Recovery Act (ISRA) and therefore is not required by state law to conduct a Preliminary Assessment or to undertake a site-wide remediation.

- The developer's (Avalon Bay) environmental consultant, EcolSciences conducted a Phase I Environmental Site Assessment of the Medical Center in 2011 under the ASTM *Standard Practice for Environmental Site Assessment* standard E1527-05.

- EcolSciences' 2011 Phase I did not identify the medical waste incinerator.

- EPA literature associates the following hazardous substances with hospital medical waste incinerators: hydrochloric acid, dioxins, furans, lead, cadmium and mercury.

- Avalon Bay's proposed Demolition Plan appears to be professional and thorough, however the possible presence of PCBs in various forms of demolition waste were not noted in the Plan.

- I recommend soil sampling prior to and during the Medical Center demolition associated with four (4) possible pathways of hazardous waste migration from the incinerator

    - Air borne emissions
    - Deposition of waste contaminants beneath the incinerator
    - Water conveyance of incinerator related waste, from drains and piping
    - Deposition of ash or residual material from the incinerator.

- All recommended soil samples should include the following laboratory analyses:

  - Cadmium and Mercury
  - Dioxins and Furans

LSRP-EXPERT REPORT
REGARDING
ENVIRONMENTAL ISSUES

UNIVERSITY MEDICAL CENTER AT PRINCETON

1.0 INTRODUCTION

1.1 Purpose

This report was prepared by Dr. Ira L. Whitman, P.E., LSRP for the Municipality of Princeton. The primary contact in Princeton for this assignment is Robert V. Kiser, P.E., Municipal Engineer.

The purpose of this engagement is to independently evaluate environmental issues associated with the medical waste incinerator at the former University Medical Center at Princeton, located at 253 Witherspoon Street, Princeton, New Jersey. I was also requested to assess environmental issues associated with the demolition plan for the hospital site.

1.2 Qualifications

Dr. Whitman is the founder and Principal of the professional firm Whitman, located in Cranbury, New Jersey. Whitman has specialized in Environmental Engineering and Management since 1985 when the company was formed. The findings and recommendations expressed are those of Dr. Ira L. Whitman, P.E., and Ph.D. who is the sole author of the report and is responsible for the report content in its entirety. Assisting in the review of reports provided by Princeton was Jessica Trifiro, Project Manager who is the leader of Whitman's due diligence group. Dr. Whitman's Curriculum Vitae is submitted herewith as Attachment 1.

1.3 Basis for this Expert Report

Princeton provided three reports pertaining to the University Medical Center at Princeton that were reviewed by Whitman to form the basis of this report. These are:

- Phase I Environmental Site Assessment, September 15, 2011, Prepared by EcolSciences, Inc. for Avalon Bay Communities, Inc.
- Limited Phase II Site Investigation Report, November 9, 2011, Prepared by EcolSciences, Inc. for Avalon Bay Communities, Inc.

- Final Summary/Submission – Demolition Plan, January 6, 2014 compiled by Avalon Bay. This submission is comprised of several reports and documents prepared by consultants and contractors.

A variety of documents on Hospital/Medical/Infectious Waste Incinerators found on EPA's and other web sites were reviewed.

Publicly available aerial photos, maps, and NJDEP Environmental Management resources (NJEMs) were accessed and reviewed.

A brief on-site inspection of the Medical Center property was conducted on January 29, 2014.

1.4 Background

A full description of the Medical Center property can best be found in the Phase I Environmental Site Assessment prepared by EcolSciences. The 8.93 acre site consists of 15 contiguous parcels within the municipal block formed by Henry Avenue to the north, Harris Road to the east, Franklin Avenue to the south and Witherspoon Street to the west.

The largest parcel, 253 Witherspoon Street is 5.63 acres and consists of the primary medical building, offices, library etc. There is also a parking garage located on 1.3 acres, and 10 residential dwellings.

The first buildings of the Princeton Hospital facility were constructed between 1918 and 1927. Prior to construction of hospital facilities, this parcel was a dairy farm. Sanborn (fire insurance) maps and aerial photographs show hospital expansion and the addition of new structures until at least 1975.

Aerial photographs show that the medical waste incinerator at the medical center was constructed between 1963 and 1969. Reportedly, the incinerator ceased operation in the 1980s or 1990s.

The hospital ceased operations in 2012, as a new facility located on U.S. Route 1 was constructed and phased into operation.

Avalon Bay Communities, Inc. has received Planning Board approval to demolish existing buildings on the property and to construct approximately 280 residential rental units on the redeveloped Medical Center site. EcolSciences, Inc., through its Phase I and Phase II reports, is addressing environmental issues on the property, primarily the removal of underground storage

tanks that previously were "closed" in conformance with NJDEP requirements and for which NJDEP issued letters of No Further Action.

At an appearance before the Municipal Council of Princeton on January 27, 2014, questions were raised by members of the Council with regard to the former presence of a medical waste incinerator. As a result of these questions, Avalon Bay agreed to conduct a television inspection of a floor drain and piping from the vicinity of the incinerator leading to the sanitary sewer. If the television inspection were to show the piping to be not of integrity, soil samples beneath the piping would be collected and analyzed for Priority Pollutant Metals.

Because of the open questions associated with the medical waste incinerator, the Municipal Council of Princeton decided to retain a senior level LSRP to provide an independent expert evaluation of the environmental issues associated with the incinerator at the former University Medical Center at Princeton.

2.0 BASIS FOR ENVIONMENTAL DUE DILIGENCE BY AVALON BAY

2.1 New Jersey Legal Requirements

2.1.1 Relevant Statutes

New Jersey has the toughest, most demanding site remediation laws in the country. The following New Jersey statutes figure into the Medical Center at Princeton – Avalon Bay environmental inquiries one way or another.

- Spill Act, 1978 - The New Jersey Spill Act defines a discharge of hazardous substances and the obligations of responsible parties subject to action under the Spill Act, which in some ways parallels the federal CERCLA or Superfund Act enacted in 1980. All of the other New Jersey statutes cited herein derived their primary legal foundation from the Spill Act.
- ECRA, 1984 - The Environmental Cleanup Responsibility Act set the "gold standard" for compliance and site remediation triggered by property transfers and closures at sites meeting the Act's definition of an "industrial operation." Hospitals and medical centers do not meet the definition of an industrial operation.
- USTs, 1990 - New Jersey's Underground Storage Tank legislation and regulations derive their legal status from the federal CERCLA amendments of 1986. Previous closures of USTs at the Princeton Medical Center were conducted under the provisions of this Act, as will the removal of the remaining USTs by Avalon Bay.

- ISRA, 1993 - Branded as the "ECRA Reform Act," the Industrial Site Recovery Act put a more positive spin on some of the harsher elements of ECRA. ISRA created a process for developers to engage in voluntary cleanup actions. One of the elements of ISRA was the mandate for soil and ground water cleanup standards, and the development of prescriptive regulations on how to clean up all sites under the Spill Act, which are known as the Technical Requirements for Site Remediation, or "Tech Regs." ISRA brought about uniformity as to how cleanups are conducted. The Medical Center at Princeton is not subject to ISRA as it too pertains specifically to industrial operations.
- SRRA, 2009 - The 30 year history of site remediation in New Jersey cited above brought about significant regulatory and bureaucratic challenges to government and the private sector conducting and completing site remediation. In 2009, a drastic change was enacted in the form of the Site Remediation Reform Act. SRRA transfers primary decision authority from NJDEP to highly experience Licensed Site Remediation Professionals (LSRP). Following an initial program of DEP issuing temporary LSRP licenses, the Site Remediation Professional Licensing Board has issued permanent licenses (renewable every 3 years) to 514 individuals who passed a comprehensive licensing exam.[1] SRRA also enabled NJDEP to significantly reduce the prescriptive nature of the "Tech Regs" and to develop detailed guidance on over 20 elements of a site remediation program. Under SRRA, LSRPs are empowered to use "professional judgment" in decision making. LSRPs are subject to a comprehensive, strict Code of Conduct founded largely on the requirement that the LSRP's highest priority in the performance of professional services shall be protective of public health, safety and the environment. In my opinion, after almost 5 years, SRRA and the LSRP program are working well.

2.1.2 Site-Wide vs. Area of Concern (AOC)

Under the Spill Act, the obligation to remediate by a Responsible Party goes back to the discovery and confirmation of a discharge. Therefore, at a site with leaking USTs the Responsible Party may address and remediate the leaking tanks without addressing or remediating the remainder of the property, unless there are other known or suspected discharges. In effect, this is what has been done and will continue to be done at the Medical Center at Princeton.

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[1] I am a member of the Site Remediation Professional Licensing Board, and I chair the Licensure Committee under which the licensing exam has been developed and offered.

Under SRRA, the term "Responsible Party" becomes the "Person Conducting the Remediation," but, with one exception, SRRA does not mandate a requirement to conduct site wide remediation.

The exception is ISRA. Because ISRA is based on closures and transfers of industrial operations and properties, ISRA requires a site-wide investigation, remediation and Response Action Outcome (RAO – issued by an LSRP; this is the SRRA equivalent of a No Further Action Letter). Since the Medical Center is not subject to ISRA, a site-wide RAO is not required under SRRA.

2.2 Environmental Due Diligence

2.2.1 EcolSciences' Phase I Assessment

Prior to acquiring the Medical Center property, Avalon Bay engaged its environmental consultant, EcolSciences to conduct a Phase I Environmental Site Assessment and a limited Phase II Environmental Site Investigation, both commonly performed acts of environmental due diligence under the American Society for Testing and Materials (ASTM) *Standard Practice for Environmental Site Assessment: Phase I Environmental Site Assessment Process* (ASTM E1527-05[2005])

ASTM first developed its E1527 Standard Practice in 1993, and has revised it several times since. The Standard Practice was revised once again in 2013, after the Phase I at the Medical Center at Princeton was conducted.

Property buyers and redevelopers conduct Phase I Site Assessments prior to acquiring a redevelopment property for several reasons:

- To qualify as "innocent purchasers" under CERCLA. Under CERCLA amendments, the ASTM E1527-05 was developed to meet EPA's requirement under 40 CFR Part 312 to qualify under "All Appropriate Inquiry."
- To assess the potential financial and schedule impacts on property ownership and redevelopment.
- To satisfy financial investors and lenders.

Under ASTM, environmental concerns and issues are defined as *Recognized Environmental Conditions*.

In its Phase I of September 2011, EcolSciences stated "This assessment has revealed the following evidence of *Recognized Environmental Conditions* in connection with the site and makes the following recommendations." The conditions noted were:

- Sewer Discharges
- Underground Storage Tanks
- Storage Tank Spill Cases
- Facility Decommissioning Requirements
- Inaccessible Areas

The following "non-scope" considerations were noted:

- Asbestos Containing Building Materials/Lead-Based Paint
- Radon

The Municipality of Princeton did not engage me to evaluate this list of environmental conditions, and for purposes of this report it is assumed that it is accurate and that EcolSciences' recommendations will be followed by Avalon Bay.

2.2.2 Medical/Infectious Waste Incinerator

The Phase I Environmental Site Assessment prepared by EcolSciences makes no reference to the former waste incinerator at the site. EcolSciences appears to have conducted a very thorough site inspection and discussions were held with Medical Center business, engineering and maintenance personnel. EcolSciences did not report that an infectious waste incinerator was present and operational for a period of 20 to 30 years.

ASTM Standard Practice E1527-05 makes no mention of waste incinerators, therefore under ASTM an incinerator is not automatically a known *Recognized Environmental Condition.* However, there are two sections of ASTM E1527-05 that strongly lead to the conclusion that a waste incinerator must be considered, and certainly must be reported in the Phase I Assessment. These are:

> Section 9.4.2.1 *Current Use(s) of the Property* – The current use(s) of the *property* shall be identified in the *report*. Any current uses likely to involve the use, treatment, storage, disposal, or generation of *hazardous substances* or *petroleum products* shall be identified in the *report*. Unoccupied occupant spaces should be noted. In identifying current uses of the *property*, more specific information is more helpful than less specific information. (For

example, it is more useful to identify uses such as a hardware store, a grocery store, or a bakery rather than simply retail use.)

Section 9.4.2.2 *Past Use(s) of the Property* – To the extent that indications of past uses of the property are *visually and/or physically observed on the site visit*, or are identified in the *interviews or records review*, they shall be identified in the *report*, and past uses so identified shall be described in the report if they are likely to have involved the use, treatment, storage, disposal, or generation of *hazardous substances* or *petroleum products*. (For example, there may be signs indicating a past use or a structure indicating a past use.)

In my opinion, a medical waste incinerator rises to the level of a past use of the Medical Center property that should have been identified in the EcolSciences' Phase I Environmental Site Assessment Report of 2011 because it was "likely to have involved the use, treatment, storage, disposal and generation of hazardous substances."

2.2.3 NJDEP Preliminary Assessment Report

Under the NJ Spill Act and the other acts cited in Section 2.1.2, neither Avalon Bay nor the Medical Center at Princeton is under any obligation to conduct a site-wide investigation and remediation. Were more extensive environmental conditions identified by EcolSciences in its Phase I, they may have recommended that a site-wide investigation and remediation be conducted.

The key to a site-wide investigation and remediation in New Jersey is the conduct of a Preliminary Assessment. A Preliminary Assessment is a form of environmental due diligence specified in the Technical Requirements for Site Remediation, N.J.A.C. 7:26E so that it conforms to New Jersey's Technical Rules. Under SRRA, NJDEP developed a Guidance Document on how to conduct a Preliminary Assessment, and a form for presenting a Preliminary Assessment Report.

A Preliminary Assessment is, in effect, a Phase I Environmental Assessment with some modifications based on New Jersey's rules that would enable a property purchaser seeking "innocent purchaser" liability protections to demonstrate that no environmental liability is identified on site at the time of the assessment. The Preliminary Assessment Report is certified by both the Person Responsible for conducting the remediation and by the LSRP.

In New Jersey, since the enactment of SRRA, it has become common practice for environmental consultants to advise clients on the merits of conducting a Preliminary Assessment in conjunction with a Phase I Environmental Assessment, largely at sites where we

believe that there is likely to be a comprehensive or complex set of environmental concerns. At Whitman, it is reported that approximately 50% of the clients so advised choose that option, which then leads to the generation of a report that we title "Phase I Environmental Site Assessment/Preliminary Assessment." Performing this work would not normally involve an LSRP, but a thorough review and certification by an LSRP is necessary if the Preliminary Assessment is eventually submitted to NJDEP.

This explanation is provided because the NJDEP Preliminary Assessment Report Form under Section D, Discharge and disposal areas, including, without limitation, lists the following Area of Concern types:

- Areas of discharge per N.J.A.C. 7:1E
- Waste piles as defined by N.J.A.C. 7:26
- Wastewater collection systems including septic systems, seepage pits and dry wells
- Landfills or land farms
- Spray fields
- Incinerators
- Historic Fill or any other Fill material
- Open pipe discharge

The significance of the NJDEP specification of incinerators for inclusion in a Preliminary Assessment without limitation is that this section is analogous to the ASTM E1527-05 Sections 9.4.2.1 and 9.4.2.2 in that it calls out the obligation to report use, treatment, storage, disposal or generation of hazardous substances.

New Jersey's Preliminary Assessment requirements that incinerators be reported and described strengthens my opinion that the medical waste incinerator at the Medical Center at Princeton should have been reported in EcolSciences' Phase I Environmental Assessment Report and addressed in Avalon Bay's 2013 Demolition Plan.

3.0 ENVIRONMENTAL CONSEQUENCES OF MEDICAL WASTE INCINERATORS

3.1 Wastes Generated by Medical Incinerators

Incinerators are high temperature combustion devices designed to destroy waste materials, not create them. However, there is never complete control over the flow of materials burned in an incinerator, therefore, despite the presence of air pollution control devices, there is no assurance that the waste residue from an incinerator or the gaseous and/or particulate air

emissions (combustion by-products) do not contain hazardous materials requiring subsequent removal or remediation.

A Mid-Atlantic Air Protection Pubic bulletin issued by USEPA in 2012 describes Hospital/Medical/Infectious Waste Incinerators thusly:

> When burned, hospital waste and medical/infectious waste emit various air pollutants, including hydrochloric acid, dioxin/furan, and the toxic metals lead, cadmium and mercury.

3.1.1 Metals – Lead, Cadmium and Mercury

Heavy metals or "Priority Pollutant Metals" consists of a family of metals characterized as hazardous by EPA, including silver, copper, nickel, lead, cadmium and mercury. These metals are commonly encountered in the environment, and are routinely sampled for in site remediation investigations involving soil, ground water and sediment sampling.

3.1.2 Dioxins

Dioxins are a class of organic chemicals that are formed during combustion processes such as waste incineration, forest fires and backyard trash burning, and some industrial processes including paper pulp bleaching and herbicides manufacturing.

The best known member of the dioxins/furans family, considered to be the most toxic is 2,3,7,8-tetrachloro dibenzo-para-dioxin (TCDD). TCDD was identified as a contaminant in Agent Orange, a herbicide used in the Vietnam War, as well as the Seveso disaster in Italy.

Site remediation investigations seldom specify sampling and analysis for dioxins, unless there is a reason to suspect the presence of dioxins in soil (it is seldom found in water). However, site investigations frequently include laboratory analyses of compounds known as Base Neutral Extractable Compounds, or Semi-Volatile Organic Compounds. In addition to the standard list of Base Neutral compounds tested for in these analyses, the laboratory produces a list of Tentatively Identified Compounds (TICs). Dioxin as a class of compounds may be listed as a TIC in a Base Neutral analysis, but the specific dioxin compound will not be identified. In order to identify the specific dioxin, including TCDD, a second and more expensive analytical analysis must be conducted. Most environmental laboratories are not certified to conduct analyses for TCDD.

3.1.3 Furans

Furans are sometimes considered to be dioxins, and sometimes considered to be a separate class of chemicals. Furans are defined as a colorless, volatile liquid derived from the dehydration of certain carbohydrates. As with dioxins, most environmental laboratories are not certified to analyze samples for specific furans.

3.2 Pathways for Contaminant Transport at the Medical Center Site

In developing a conceptual model for how to deal with the environmental consequences of a medical waste incinerator, one must consider the pathways by which hazardous materials are transported from their point of origin to their point of deposition.

The point of origin of medical and other wastes that were incinerated at the Medical Center at Princeton could be anywhere on the hospital grounds. But the focal point for a potential investigation is the location of the former incinerator itself. The following pathways are noted:

- Air borne emission of particulate and gaseous matter from the incinerator, with subsequent deposition within an unknown radius on to soil or paved surfaces, or on to roof drains.
- Deposition of waste contaminants in the soil beneath the incinerator and/or incinerator room.
- Water conveyance of incinerator related waste through a floor drain adjacent to the incinerator and piping from the floor drain to a sanitary sewer, and through the sanitary sewer.
- Removal of ash or residue material from the incinerator to a point on the hospital grounds where it may have been deposited or buried.

3.3 Recommended Sampling for Incinerator Generated Contaminants

Following the pathways described in Section 3.2, I recommend that Avalon Bay be required to perform soil sampling related to those pathways based upon the potential for incinerator generated contaminants to have migrated to the soil on the Medical Center property.

I recommend that each soil sample be analyzed for the following categories of chemicals.

- Priority Pollutant Metals – specifically lead, mercury and cadmium.
- Dioxins and furans.

Any positive findings of one or more contaminants above residential soil cleanup standards must result in the following response by Avalon Bay.

- Additional soil samples to delineate the presence of the contaminants (s) horizontally and vertically.
- Appropriate reporting of a discharge to NJDEP, and notification to Princeton municipality.
- If warranted under the Technical Requirements for Site Remediation, N.J.A.C. 7:26E conducting an appropriate remedial action.

The following sampling protocols are recommended for each of the likely pathways for contaminant transport at the medical center site.

3.3.1 Airborne Emissions

On February 24, 2014 I met with representatives of Avalon Bay, Ecol Sciences and the Municipality of Princeton at the hospital site in the vicinity of the incinerator stack. The purpose was to identify viable locations for soil sampling in unpaved areas with exposure of soil to the airborne emissions from the medical waste incinerator.

Two viable locations were identified:

1. A grassy area south of the incinerator stack approximately 40-60' from the base of the stack.

2. The backyard of the residential property adjacent to the parking garage, approximately 150 feet from the base of the stack.

Soil samples, where possible, should be taken over a 6 inch interval at a depth of 6-12 inches and analyzed for cadmium, mercury, dioxins and furans.

Lead was eliminated as a material for laboratory analysis due to the common presence of lead in soil from a multitude of urban sources.

I also recommended that a soil sample be taken at any location on the hospital grounds where a roof downspout or leader discharges storm water on to bare soil. According to Avalon Bay's demolition contractor, there are no such downspouts on the hospital building – all downspouts discharge directly into an underground storm water drainage system.

3.3.2 Deposition of Wastes in Soil

In item #7 of the Avalon Bay cover letter of January 6, 2014 referred to previously, Avalon Bay incorporated the following into its Demolition Plan.

> Avalon Bay will inspect the soil underlying the former incinerator room, after this portion of the building is demolished. Consistent with NJDEP regulations, this inspection shall include field-screening of the soil for organic vapors with a photoionization detector. If evidence of a discharge is identified by the LSRP or its designee, soil sampling shall be conducted at the direction of the LSRP.

I recommend that soil sampling be conducted at this location regardless of whether evidence of a discharge is identified. I recommend that one sample be taken from the soil immediately beneath the invert of the floor drain pipe beneath the incinerator room and analyzed at an NJDEP-certified laboratory for lead, cadmium, mercury, dioxins and furans. If any of these materials are present in concentrations above residential soil standards, additional samples should be taken to attain horizontal and vertical delineation of the presence of the contaminant.

3.3.3 Water Conveyance

Avalon Bay plans to conduct a television survey of the drainage system present beneath the medical waste incinerator, including the sanitary sewer exiting the building. If locations are found that appear to have had discharges from the piping, soil samples will be taken.

Soil samples, where possible, should be taken over a 6 inch interval at a depth of 6-12 inches, screened with a PID for Volatile Organics, and analyzed for cadmium, mercury, dioxins and furans.

3.3.4 Ash or Residue

If ash or residue is observed on the ground - bare soil or paved area – during demolition, one or more soil samples should be taken where the residue is observed.

Soil samples, where possible, should be taken over a 6 inch interval at a depth of 6-12 inches, screened with a PID for Volatile Organics, and analyzed for cadmium, mercury, lead, dioxins and furans.

Prior to disposal, any accumulated ash or residue should be sampled and analyzed for appropriate waste disposal characteristics.

4.0 ENVIRONMENTAL CONSEQUENCES OF DEMOLITION

Avalon Bay's January 2014 Demolition Plan highlights a number of areas dealing with environmental issues and consequences.

The Municipality of Princeton asked for my review and comments to the Demolition Plan, which upon the initial reading appears to be very thorough and professional. The one comment offered at this time refers to the bulleted item for day 140 through 150 in the plan.

- Day 140-150: All debris will be removed from the site with the exception of masonry that the site contractor needs to be crushed and utilized to assist bringing a portion of the site to grade.

My concern is that all such crushed concrete must meet applicable for NJDEP standards for clean fill, and if necessary, samples should be taken of all masonry crushed for on-site or off-site use, and analyzed at a minimum for PCBs. This is based on experience at other demolition sites in New Jersey where PCBs were unexpectedly found in crushed concrete designed for re-use. However, the demolition contractor is responsible to meet these requirements, and this does not represent an issue likely to impact the community.

I was asked by the Municipality of Princeton to give an opinion on the number of air monitoring stations that should be in place during building demolition activity (the demolition contractor planned to operate one such station). I recommend that 4 air monitoring stations be used as a measure of protection to the community. The municipality should be notified immediately upon any air monitor exceeding the target air quality parameters.

On February 24, in a meeting that included the demolition contractor, I expressed my concern regarding the possible presence of PCBs in window caulking, mastics and other non-electrical building materials. The demolition contractor stated that by his company's assessment of materials in the building, no such PCB suspect materials are present.

ATTACHMENT

CURRICULUM VITAE

IRA L. WHITMAN, PH.D., P.E.

PRINCIPAL

EDUCATION

Ph. D. Environmental Engineering Science — 1968
The Johns Hopkins University

M.S. Civil Engineering — 1963
The Polytechnic Institute of Brooklyn

B.C.E. Civil Engineering — 1961
The Cooper Union

REGISTRATION AND CERTIFICATION

Board Certified Environmental Engineer, American Academy of Environmental Engineers
Certified in the specialty of Hazardous Waste Management

Registered Professional Engineer, New Jersey, New York,
Maryland, Ohio, Delaware, Pennsylvania

Certified as a Licensed Site Remediation Professional (LSRP) — LSRP #573679

RESPONSIBILITY AND EXPERIENCE, WHITMAN

In 1985, Dr. Whitman founded Whitman, consultants in Environmental Engineering and Management. The company is dedicated to serving its clients in the field of environmental compliance by bridging the gap between management and technical issues in environmental compliance and property redevelopment.

Dr. Whitman is an expert on site remediation, compliance with ISRA, the New Jersey Industrial Site Recovery Act, and on Brownfield site redevelopment. The Whitman Companies has managed environmental compliance projects for industries in most fields of manufacturing, including chemicals, steel, electronics, ceramics, printing, rubber and machinery. He serves on the Site Remediation Advisory Committee, a group established to assist NJDEP in implementing its site remediation activities.

Dr, Whitman is an active participant in NJDEP's "Stakeholder Process" engaged in implementing the new LSRP Program under the Site Remediation Reform Act as a member of the "Measures of Success" working group. He has been appointed by the Governor to a seat on the LSRP Licensing Board, and chairs the Licensure Committee of the Board.

Dr. Whitman has devoted considerable attention to the problems of redeveloping urban industrial sites and the risks and economic benefits associated with site reuse. He has helped to guide a national effort on Brownfields through the Northeast Midwest Institute in Washington, D.C., as a member of the Institute's Board of Directors, and a municipal effort as a member of the Brownfields Environmental Solutions for Trenton (BEST) advisory group since 1995.

Dr. Whitman has served in an expert capacity on numerous cases involving environmental compliance and site remediation. He has prepared expert reports and testimony involving ground water and soil contamination, site redevelopment, underground storage tanks, and a variety of regulatory, engineering, insurance and scientific matters. He has recently expanded his areas of interest to include alternative conflict resolution and mediation approaches applied to environmental and business conflicts, and is presently looking into the relationship between climate change (global warming) and environmental degradation.

Dr. Whitman's other recent professional assignments include:

- Representing clients in matters of insurance claims pertaining to site remediation
- Review and comment on proposed environmental regulations and legislation
- Providing expert testimony on site remediation with regard to the condemnation taking of a large Brownfield site in an arbitration hearing conducted under procedures established by the New Jersey Supreme Court in Housing Authority of the City of New Brunswick v. Suydam Investors, LLC.
- Serving as an expert in the Suydam Investors Case on behalf of the property owner whose property was taken by Eminent Domain.

SUMMARY OF OTHER PROFESSIONAL EXPERIENCE

Princeton Aqua Science **1980-1985**
Edison, New Jersey

President and C.E.O.

Responsible for all business, technical and marketing activities for Princeton Aqua Science, a firm of environmental scientists and engineers.

- In five years led the firm to a five-fold increase in sales, and a ten-fold increase in profits.
- Developed regional preeminence in chemical and aquatic bioassay analysis, hazardous waste site investigation, and environmental impact analysis.
- Directed staff of 80 including eight Ph.D.s and six Registered Professional Engineers. Disciplines included geology, chemistry, biology, civil, chemical, mechanical, and environmental engineering.

- Managed all marketing, sales, and public relations.
- Responsible for developing and implementing annual business plans, budgets, and capital acquisition and marketing programs for the company.

Dr. Whitman guided PAS into becoming one of the primary ECRA and site remediation authorities in the state, areas of environmental engineering that were responsible for much of the company's growth. Because of PAS' established reputation as an ECRA consultant, the firm was acquired in 1985 by a major national environmental engineering and remediation consulting firm.

NUS Corporation **1976-1980**
Gaithersburg, Maryland

Director, Public Works Programs

Responsible for developing and executing projects in environmental engineering and energy for federal, state, and local agencies. Served as advisor to corporate management on the development of programs in hazardous waste management. Public sector business development included projects related to:

- Advanced wastewater treatment
- Energy development, conservation, and integrated uses
- Solid waste, resource and fuel recovery
- Water resources management

Ira L. Whitman, P.E. **1975-1976**
Environmental Engineering and Management
Columbus, Ohio

Principal

Sole proprietor in environmental consulting during 18-month period. Private and public sector clients included American Public Works Association (APWA) and National Academy of Science. For APWA, developed a 40-hour EPA training program entitled "Troubleshooting Operations at Wastewater Treatment Plants." Course was presented in all ten EPA regions.

State of Ohio EPA **1972-1975**
Columbus, Ohio

Director and Member of Governor's Cabinet

Served as organizer and first Director of the Ohio EPA. Management, regulatory and technical responsibility for all State programs in water and air pollution control, solid waste, drinking water, environmental impact and comprehensive water planning. As Ohio EPA Director, served on the boards of the following authorities:

- Ohio Power Siting Commission, Chairman
- ORSANCO
- Great Lakes Basin Commission
- Ohio Air and Water Development Authorities
- IJC Great Lakes Water Quality Board
- Trustee, Association of State and Interstate Water Pollution Control Agencies

Battelle Memorial Institute **1968-1972**
Columbus, Ohio

Director, Urban and Environmental Planning Programs

Organized and managed programs in environmental planning, EIS analysis, water resources and regional development. Developed the first quantitative environmental evaluation system under NEPA for the U.S. Bureau of Reclamation, U.S.D.I. Managed a large multidisciplinary evaluation of resource management in the Great Lakes basin, which included collaboration with Elinor Ostrom, recent recipient of the Nobel Prize in Economics.

Prior to Battelle, employment included flood plain management and hydraulic engineering for the Baltimore and New York Districts, U.S. Army Corps of Engineers.

PRESENTATIONS AND SPEAKING ENGAGEMENTS

Dr. Whitman actively speaks on many subjects in the environmental field. Recent speaking engagements include:

1. June 2012 — SRP Licensing Board Activities, New Jersey Water Environment Association, Eatontown, New Jersey

2. May 2012 — Hydraulic Fracturing, East Brunswick Public Library, East Brunswick, New Jersey

3. June 2011 — Definition and "Rules" of an LSRP, New Jersey Environmental Business Council, Edison, New Jersey.

4. June 2011 — LSRP Program Vision and Realities, New Jersey Water Environment Association, Eatontown, New Jersey.

5. February 2011 — LSRP Licensing Board, Rutgers Continuing Professional Education, Environmental Law and Regulation.

6. November 2009 — LSRP Code of Conduct – Licensing Board, New Jersey Water Environment Association, Eatontown, New Jersey.

7. March 2007
January 2008 — Global Warming, Brandeis University National Women's Committee, East Brunswick, New Jersey and subsequent presentations on the international and political issues associated with climate change.

8. December 2006 — Environmental Issues in Commercial Real Estate Practice, New Jersey Institute for Continuing Legal Education, New Brunswick, New Jersey

9. November 2006 — Brownfields 101, Workshop at EPA National Brownfields Conference, Boston, Massachusetts

10. July 2006 — Market Driven Decision Making – Brownfield Redevelopment by the Private Sector, Brownfields 2006, Wessex Institute of Technology, Tallin, Estonia

11. May 2005 — Evaluating Environmental Liability, 2005 Industrial Property Summit, Chicago, Illinois

12. October 2004 — Brownfield Redevelopment – How Ready Are You To Market Your Sites?, ICMA National Conference, San Diego, California

13. March 2004 — Things You Learn on the Job As An Expert Witness, Cook College Seminar
March 2006 — The Role of the Environmental Professional in Litigation.
March 2011 — The Role of the Environmental Professional in Litigation.
March 2012 — How to be An Expert at Being An Expert

14. February 2004 — How Developers Value Land Reuse, Resources for the Future Workshop on Estimating Community Economic Impacts from the Reuse of Contaminated Properties, Washington, D.C.

15. December 2002 — Why Redevelopment of Contaminated Properties Works in New Jersey Financial Transaction Committee, New Jersey Bar Association

16. November 2002 Profile of The Brownfield Developer
Brownfields 2002 Conference, Charlotte, North Carolina

17. December 2001 Brownfield Case Study: Brooklyn Navy Yard
New York Real Estate Forum, Baruch College, New York, New York

18. September 2001 Brownfield Stakeholders, Partnership For Sustainable Brownfield Redevelopment, Brownfields 2001 Conference, Chicago, Illinois

19. Sept.-Nov. 1996 Lectures at eleven universities nationwide on Brownfield Site Remediation and Restoration, endowed Kappe lecturer by American Academy of Environmental Engineers

20. January 1995 Identifying and Prioritizing Contamination Problems at Brownfields Sites, USEPA Brownfields Workshops, Newark, NJ, Buffalo, NY and San Juan, PR

PROFESSIONAL ASSOCIATIONS AND ACTIVITIES

American Academy of Environmental Engineers

American Society of Civil Engineers (Life Member)

Water Environment Federation

Site Remediation Committee, NJ Water Environment Association

National Association of Industrial and Office Properties

Licensed Site Remediation Professional Association of New Jersey

Dr. Whitman served as Chairman of The Clean Water Act Reauthorization Committee and the Government Affairs Committee for the Water Environment Federation, Alexandria, Virginia. He has been a Director at Large on the Board of Control of the Federation and a member of the Executive Committee. In 1998, he was honored by the Federation as an Honorary Member of WEF in recognition of his years of professional contribution and service.

Dr. Whitman served on the Board of Directors of the Northeast-Midwest Institute, a non-profit research and policy organization serving the 18 state Northeast and Midwest Regions. He was a member of the Training and Technology Transfer Advisory Committee of the Northeast Hazardous Substance Research Center, New Jersey Institute of Technology and The Outreach Advisory Committee, Center for Hazardous Substances in Urban Environments, The Johns Hopkins University.

In 1992, Dr. Whitman received the NJWPCA award for Professional Advancement of Hazardous Waste Management. In 1996 he became the first recipient of WEF's national award

for Hazardous Waste Management. In 2008 he received the Gano Dunn Engineering Alumni Award from the Cooper Union Alumni Association.

Dr. Whitman has served on professional panels and advisory groups throughout his career, including: Board of Trustees, New Jersey Marine Sciences Consortium; Advisory groups to New Jersey Department of Environmental Protection, National Academy of Sciences, and USEPA.

PUBLICATIONS

Dr. Whitman has authored numerous professional publications in the field of Environmental Management. Selected publications include:

"Overcoming Environmental Constraints to Redevelopment", Chapter 12, Redevelopment, American Bar Association, 2008

"Global Warming – Global Opportunity", NJBIZ, April 16, 2007

"Brownfield Redevelopment By the Private Sector," Proceedings, Brownfields III Conference, July 2006, WIT Press, Southampton, U.K.

"Redevelopment of Portfields," New Jersey Brownfields Marketplace, May 2004

"Smart Growth – Is It For Real?," National Hotel Executive, August 2003

"A Look at New Issues in Brownfield Redevelopment," New Jersey Real Estate Journal, April 2002

"New Opportunities for Brownfield Redevelopment," Pollution Engineering, March 2002

"Buying Into Brownfields," Commercial Investment Real Estate, September/October 2001

"Putting the Development in Brownfield Redevelopment," Environmental Protection, August 2000, Co-author Barry Skoultchi

"Engineering The Remediation of Brownfields Sites," EM, Air & Waste Management Association's Magazine for Environmental Managers, April 1997