BOROUGH OF RINGWOOD

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May 18, 2012

Joseph A. Gowers, project Manager
Southern New Jersey Remediation Section
USEPA Region II
290 Broadway, 19th Floor
New York, New York 10007-1866

Re: Ringwood Mines/Landfill Site
Stakeholder Submission to the EPA National Remedy Review Board

Dear Mr. Gowers:

On behalf of the citizens of the Borough of Ringwood, please accept the enclosed submission from the Ringwood Council and a copy of Resolution No. 2012-147 dated May 15, 2012 authorizing the submission to the EPA. Please include the Borough's submission in your package to the National Remedy Review Board for their consideration when they meet on June 20, 2012.

If you or anyone on the Board has any questions about the Borough's submission, or would like the Borough to meet with the Board, please do not hesitate to contact me.

Thank you for your consideration of our submission and the concerns and comments expressed by the Borough, as the host municipality, on behalf of our 12,000 residents.

Regards,

Scott Heck, C.P. W.M.
Borough Manager

Enclosures

Resolution Number
2012-147

BE IT RESOLVED that the Municipal Council of the Borough of Ringwood hereby authorize the submission of Stakeholders letter to EPA as presented by the Borough's Environmental Counsel and Environmental Engineer with minor revisions to be approved by the Borough Manager before submission.

Linda M. Schaefer

LINDA M. SCHAEFER, MAYOR

I hereby certify that the above Resolution was adopted by the Municipal Council of the Borough of Ringwood at its Business Meeting of May 15, 2012.

Kelley A. Rohde

KELLEY A. ROHDE, RMC
BOROUGH CLERK

Council Member	Motion	Second	Ayes	Nays	Abstain	Absent
Schaefer			X			
Speer			X			
Anderson			X			
Davison			X			
Marsala		X	X			
Martocci	X		X			
Noonan			X			

Overview of Site Conditions and Feasible Remedial Action Alternatives for Protection of Human Health and the Environment at the Ringwood Mines/Landfill Superfund Site: Peters Mine Pit Area, O'Connor Disposal Area, and Cannon Mine Pit Area
Ringwood, Passaic County, New Jersey

Submitted to:

The National Remedy Review Board
U.S. Environmental Protection Agency

Submitted by:

Mayor and Council
of the Borough of Ringwood

May 18, 2012

1.0 INTRODUCTION

This submission is made on behalf of the Borough of Ringwood (Borough), through its duly elected members of the municipal Council[1], as the host municipality, property owner and potentially responsible party (PRP). Although the Ringwood Mines/Landfill Superfund Site (Site) is located in Upper Ringwood, the Site and consideration of the appropriate remedy affect all of the 12,000 Ringwood residents who are represented by the Council. Council members Linda Schaefer[2] and John Speer[3] are also members of the Ringwood Community Advisory Group (CAG).

The Site includes approximately 500 acres within Upper Ringwood and encompasses moderately rugged forested areas, open areas of overgrown vegetation, abandoned mine shafts and surface pits, the municipal recycling center, the Ringwood Borough Garage, several residential properties, and a small portion of the Ringwood State Park which is located north and east of the Site. A map showing the location of the Site in reference to surrounding surface waters, the Wanaque Reservoir, and the Borough's municipal drinking water wells is provided as Figure 1.

At the April 24, 2012 CAG meeting, the United States Environmental Protection Agency (USEPA) advised that stakeholder letters must be submitted by May 18, 2012 for consideration at the June 18, 2012 meeting of the National Remedy Review Board (NRRB). In anticipation of submitting a stakeholder letter on behalf of Ringwood, Mayor Schaefer and the Council wanted to solicit input from Ringwood residents, in addition to the three CAG members who are Upper Ringwood residents and who expressed their views during the CAG meeting.

On May 3, 2012, the Borough published a notice for a special Council meeting for May 10, 2012 at which the Borough's professionals provided an overview and explanation of the advantages and disadvantages of the remedies being considered by USEPA for the Site from the Borough's perspective as the host municipality. This forum enabled the public, as well as the Mayor and Council, to ask questions about the Site and express their concerns or opinions, for consideration by the Council. About eight Borough residents attended this meeting and only two residents made comments to the Council.

This submission incorporates the public comments made by the Borough residents and by the Council with the best interests of the entire Borough of Ringwood community in mind. The balance of this submission provides an overview of the environmental conditions within each of the three land Areas of Concern (ACs) that were discussed at the May 10, 2012 Public Meeting conducted by the Borough, including soil, groundwater, surface water and sediment quality associated with each land AC, placed into perspective with respect to the magnitude of constituent exceedances and their associated risk as determined based on human health and ecological risk assessments conducted at the Site to date.

2.0 DUAL ROLE AS HOST MUNICIPALITY/POTENTIALLY RESPONSIBLE PARTY

The Borough owns[5] the majority of the Site creating its dual role as the host municipality and a PRP. The Borough's first priority is to ensure the Site is thoroughly investigated and properly remediated for the protection of human health and the environment both in the short and long term. The Borough and its residents have suffered for many years the long-lasting negative impacts caused by the stigma of this Superfund Site which will dissipate only after the Site is remediated and removed from the National Priorities List (NPL). Timeliness of the remaining work is a major concern and therefore, closure of the Site and finality are also of paramount interest to the Borough.

3.0 BOROUGH'S OBJECTIVES

The Borough's primary objective is to support the USEPA's selection of a remedy for the Peters Mine Pit Area, Cannon Mine Pit Area, and O'Connor Disposal Area which is:

- Protective of human health, environment, community and residents
- Technically justified and appropriate for the documented risks
- Can be implemented in a timely manner
- Does not cause further risk or harm to the environment, residents, existing infrastructure, or the community
- Least disruption/disturbance to the community and its residents

The Borough wants to be assured of the adequacy of the investigation as:

- The Borough is the only party to remain after the Site is closed and de-listed
- The Borough owns most of the property that is the subject of this submittal
- Leads to the most appropriate remedies to be selected for each of the three land areas

4.0 THE BOROUGH'S REMEDIAL ACTION ALTERNATIVE EVALUATION PROCESS

In consideration of the proposed remedial action alternatives, in addition to ensuring a thorough investigation and appropriate remediation of the Site, the Borough is concerned about how long it will take to implement and complete the field activities associated with the selected remedies. First, the Borough must consider whether or not a remedial action alternative is protective of human health and the environment. For those which are, next we must evaluate each alternative by comparing the relative "cost" (which include risks, monetary, and time) in the context of the level of protection and effectiveness of a given alternative.

Finally, if the choices are narrowed down to Excavation/Disposal and construction of an Engineered Cap with Institutional Controls, we must compare the cost of implementation (as defined above) to what, if any, the added level of protection and effectiveness an excavation remedy would provide over capping given the minimal risks posed by the existing "pre-remediation" conditions as documented by the extensive investigations and risk assessments conducted at the Site (ARCADIS, 2012a-2012k).

The Borough has consulted with its environmental expert, Excel Environmental Resources, Inc. (EXCEL), the USEPA, New Jersey Department of Environmental Protection (NJDEP), Ford, and Ford's environmental consultant, ARCADIS, and has concluded that the two remedies, or variations thereof, that are likely being considered by USEPA and being presented to the NRRB are Excavation/Disposal and use of Engineering Controls in the form of an Engineered Cap with Institutional Controls in the form of a Deed Notice. At the conclusion of the NRRB process, the Borough will further evaluate the remedial action alternatives after considering the technical recommendations by the NRRB, USEPA Region 2, NJDEP, EXCEL and community/resident concerns.

5.0 RETENTION OF THE BOROUGH'S ENVIRONMENTAL EXPERT

EXCEL was retained by the Borough to provide expert technical and regulatory consultation for review and evaluation of the Remedial Investigation (RI), Risk Assessment, and Feasibility Study (FS) activities that have been recently conducted to address three land ACs and a fourth AC, referred to as Site-Related Groundwater, at the Site. EXCEL's role has been to provide input regarding the technical and regulatory adequacy, appropriateness, and thoroughness of the work and resulting data generation and interpretation in an effort to ensure that the approach to characterization of the Site and the evaluation of feasible Remedial Action alternatives is sound, accurate, reliable, and defensible now and in the future.

Over the past many months, EXCEL has worked closely with Ford and Ford's environmental consultant, ARCADIS, and has been actively participating in the finalization of documents recently submitted by ARCADIS on behalf of Ford for agency review. These documents include the recently revised RI Reports, Baseline Human Health Risk Assessment (BHHRA) Reports, Screening Level Ecological Risk Assessment (SLERA) Reports, and the recently issued Draft FS Reports for Peters Mine Pit, Cannon Mine Pit and the O'Connor Disposal Area.

It is important to recognize that EXCEL has conducted their review and comment on the work with no pre-conceived notion with respect to the outcome of their evaluation. In fact, EXCEL has provided constructive and, when deemed warranted, critical feedback to Ford and ARCADIS which has often resulted in ARCADIS re-evaluating, or more closely examining, certain data and their meaningfulness with respect to the Conceptual Site Model for the Site.

For example, with respect to the Site-Related Groundwater AC, EXCEL's input has recently resulted in the recommendation to conduct additional investigative field work to refine and more fully and clearly develop the groundwater component of the Conceptual Site Model. With agency approval of the work scope, the Supplemental RI activities for the Site-Related Groundwater AC are currently in progress. As further discussed in Section 3.4 below, because the RI has not been completed for the Site-Related Groundwater AC, groundwater is not included in the list of ACs for which a remedy evaluation is currently being conducted by USEPA.

5.1 Separation of Groundwater from the Three Land ACs

One of the issues raised by EXCEL early on in their role as the Borough's environmental expert is that, although groundwater data has been generated during the RI conducted within each of the three land ACs, the USEPA decided to separate groundwater at the Site into a separate AC referred to as "Site-Related Groundwater". The work scope and schedule of activities for the Site-Related Groundwater AC have progressed on a separate track from the three land ACs that are the subject of this submission. Since the schedule for conducting RI and Risk Assessment and FS activities and issuing the reports for the three land ACs has been greatly accelerated beyond the timeframes outlined in Ford's 2010 Administrative Order on Consent (AOC) with USEPA, the schedule for implementation of the RI for the Site-Related Groundwater AC is lagging behind.

The net result of bifurcating groundwater from the land ACs while, at the same time, not accelerating the schedule for implementation of RI activities needed to address data gaps in the characterization of groundwater quality at the Site is that evaluation of feasible remedial action alternatives for the three land ACs is progressing without the benefit of the final RI Report for Site-Related Groundwater. As USEPA is aware, at the direction of USEPA over the objection of Ford and the Borough, the RI and FS Reports for the three land ACs have been drafted and submitted without the benefit of these additional groundwater data. This is an important fact to consider while evaluating the efficacy of the various remedial action alternatives for the three land ACs given that the record will show that the FS for the three land ACs was conducted before the groundwater RI was completed.

Early on, and on several occasions during meetings with the agencies, the Borough and representatives of the CAG raised concerns regarding separation of groundwater at the Site into a separate AC because of concern regarding the Wanaque Reservoir located approximately one mile downgradient of the Site. The Wanaque is a source of drinking water not only for residents of the Borough but also serves as a drinking water source for millions of New Jersey residents. To address and mitigate this concern, the environmental consultants for Ford and the Borough (ARCADIS and EXCEL, respectively) have utilized existing groundwater data generated during the RI for each of the three land ACs to evaluate whether or not any of the three land ACs has, or has the future potential to, adversely impact groundwater quality and whether or not the Wanaque Reservoir or the Boroughs municipal drinking water supply wells, are at risk of being adversely impacted. Many years of groundwater flow and analytical data have been generated by Ford over the course of the previous and recent

Superfund investigations. These data exist for the individual land ACs as well as for the areas downgradient towards the Reservoir. These groundwater data were therefore utilized during the evaluation of remedial action alternatives detailed in the Draft FS Reports that were generated by ARCADIS in collaboration with EXCEL.

5.2 Source Removal and Presumptive Remedy Evaluation

During the Public Meeting conducted by the Borough on May 10, 2012, EXCEL clarified for the Counsel and the public that there is a definitive distinction between the historic occurrence of paint sludge on the surface of the Site which are referred to as "Sludge Removal", or SR Areas, and the conditions within the three land ACs that are the subject of the NRRB review: the Peters Mine Pit, Cannon Mine Pit, and O'Connor Disposal Area. As the agency is aware, the Site was originally identified and ultimately placed on the NPL by the USEPA due to the identification of surficial deposits of paint sludge from the Ford Mahwah Automotive Assembly plant. A total of approximately 11,900 tons of paint sludge was excavated by Ford and transported for offsite disposal at a permitted facility during the initial Superfund activities in the late 1990's and early 2000's.

Since the Site was re-listed to the NPL in 2005, a total of 13 additional SR Areas have been identified and approximately 12,900 tons of additional paint sludge (plus an estimated 34,100 tons of soil and other waste materials excavated and disposed of along with the sludge deposits) have been excavated and transported for offsite disposal. The analytical results of post-excavation soil samples have confirmed the effectiveness of these removal actions and the achievement of the most stringent soil remediation standards for all constituents of concern within each area.

Of the additional 12,900 tons of sludge removed since the re-listing in 2005, approximately 2,200 tons of this paint sludge was removed during exploratory test pit activities within the O'Connor Disposal Area, however, paint sludge was not encountered within the Cannon Mine Pit and only sub-grade pockets or accumulations of paint sludge were encountered within the Peters Mine Pit. As discussed in more detail in Section 6.0 of this submittal, the findings of the extensive investigation and characterization of each of these three land ACs indicates that the detections of soil exceedances within each land AC are sporadic and infrequent and the concentrations in soil are variable but generally low and would meet the USEPA definition of "Low Level Threat Waste".

5.3 Containment is Presumptive Remedy For Low Level Threat Waste

USEPA defines "Low Level Threat Waste" as waste that poses a relatively low long-term threat in that they exhibit low toxicity, low mobility in the environment, or are near health-based levels (USEPA, 1991). The Borough understands that the USEPA's "Presumptive Remedy" (or preferred technology) for Low Level Threat Waste, especially when it occurs in conjunction with non-hazardous solid waste from municipal sources, is containment using Engineering Controls and an Institutional Control such as a Deed Notice which is deemed protective of human health and the environment and consistent with remedial action objectives for landfills such as those at the Ringwood Site (USEPA, 1991; USEPA, 2012).

As outlined in each of the three FS Reports, excavation and offsite disposal is another feasible remedial action alternative which has been considered for the three land ACs as part of the FS process to date. The Borough understands that excavation and disposal is typically recommended only when there is "Principal Threat Waste" that is an active source of adverse impacts to groundwater and other remedies will not effectively control the source material (USEPA, 1997). "Principal Threat Waste" is defined by USEPA as source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur. Given that none of the fill/waste material in any of the three land ACs at the Site is "Principal Threat Waste", the advantages and disadvantages of such an extreme and highly intrusive remedy need to be fully and carefully vetted and evaluated, especially given that, under

existing "pre-remediation" conditions, groundwater quality is essentially unaffected and poses no risk to any human or ecological receptor (ARCADIS, 2012a-2012k; USEPA, 1991).

Specifically, as further discussed in Section 4, and is consistent with the classification of fill/waste material within the three land ACs as "Low Level Threat Waste", the groundwater analytical results generated over more than 20 years of monitoring for the Cannon Mine Pit Area indicate no adverse impact to groundwater whatsoever within the Cannon Mine Pit Area (ARCADIS, 2012d). The results of the RI indicate only naturally occurring metals classified by NJDEP regulations as "secondary parameters" (including iron, manganese, aluminum, sodium, etc.) and an occasional sporadic exceedance of arsenic in groundwater in the O'Connor Disposal Area (ARCADIS, 2012h).

In the Peters Mine Pit Area, groundwater exhibits the same naturally occurring metals as in the O'Connor Disposal Area and generally minimal (typically single digit) concentrations of benzene in groundwater immediately downgradient of Peters Mine Pit (ARCADIS, 2012b). In fact, groundwater quality within the Pit itself indicates that benzene concentrations have decreased and are now below the 1 micrograms per liter (ug/L) Groundwater Quality Standard (GWQS). Benzene has remained below the 1 ug/L GWQS as documented by the past three years of annual monitoring. Benzene has been reported at a concentration of 30 ug/L in water at the base of the Peters Mine Air Shaft at a depth below grade of 230 feet, however, data from bedrock monitoring wells installed immediately downgradient of the Air Shaft indicate no benzene in groundwater since the wells were installed and during the past two years of annual monitoring. Based on multiple lines of existing evidence, the data indicate that benzene in the Air Shaft is isolated and there is no indication of lateral or vertical migration beyond the Shaft (ARCADIS, 2012b).

As previously discussed in Section 3.1, the Supplemental RI activities proposed by Ford and the Borough and approved by USEPA to verify and/or refine these conclusions are currently underway as part of the Site-Related Groundwater AC which, as previously noted, was bifurcated from the land ACs by, and at the direction of the USEPA despite objections by Ford and the Borough. Note, however, that it is EXCEL's professional opinion that, based on the preponderance of existing evidence generated to date, including many years of groundwater, surface water, and sediment sampling within the Peters Mine Pit Area, the residual benzene is not migrating beyond the Air Shaft and there is no groundwater or groundwater to surface water pathway for the single digit residual benzene levels in groundwater downgradient of the Pit to impact any human or ecological receptor (ARCADIS, 2012a-2012c). As further discussed in Section 6.0 below, the risk to human and/or ecological receptors posed by these three land ACs is therefore only via the direct contact/ingestion/inhalation pathway.

6.0 OVERVIEW OF ENVIRONMENTAL CONDITIONS

Based on the RI and Risk Assessments conducted for the three land ACs, Peters Mine Pit, Cannon Mine Pit and the O'Connor Disposal Area, the following is a brief summary of the overall environmental conditions at each of the three land ACs, including groundwater quality in the immediate vicinity of each AC. The RI, BHHRA, and SLERA Reports prepared by ARCADIS on behalf of Ford are referenced in Section 6.0 of this submission.

Peters Mine Pit:

- The Peters Mine Pit is approximately 460 feet long by 200 feet wide and averages approximately 55 feet deep with a maximum depth of approximately 92 feet. The Peters Mine Pit Area is approximately 3 acres in size. A generalized Cross-Section of the Pit area taken from the Revised RI Report (Arcadis Figure 6) is attached for reference to illustrate the configuration of this historic mining feature.
- There is a shallow pond on the surface of a portion of the Pit that was created when materials within the Pit subsided after the Pit was filled and covered with soil many years ago. The results of the RI indicate that the pond is an expression of the shallow water table.

- Soil and fill material within the Pit exhibits sporadic and generally very low concentrations of various constituents, including metals, polyaromatic hydrocarbons (PAHs), volatile organic compounds (VOCs) including benzene, ethylbenzene, toluene, and xylenes (BTEX) and polychlorinated biphenyls (PCBs) with no pattern exhibited by the distribution and concentrations that meet the definition of "Low Level Threat Waste" and which do not rise to the level associated with "Principal Threat Waste" (USEPA, 1991).
- As shown in the attached Cross-Section, occasional subgrade pockets of paint sludge were encountered in borings conducted within the Pit, however, the data from the RI indicates these paint sludge accumulations are sporadic and not significant in size. Paint sludge does not occur at the ground surface within the Peters Mine Pit Area or in the shallower fill material surrounding the pond.
- The constituents reported in the fill materials pose a potential risk to human health and the environment via the direct contact/ingestion/inhalation pathway therefore remedial action is warranted to address the risk posed by the direct contact pathway.
- The PAHs, PCBs and metals reported in the fill material generally have a strong affinity for sorption to soil and other organic matter in the subsurface and are generally not highly soluble in water. Although more soluble in water, the concentrations of BTEX reported in the fill are sporadic and, although some exceed soil remediation standards, the exceedances are generally slight.
- Groundwater quality within the Peters Mine Pit verifies the aforementioned findings with respect to the absence of any organic constituents at concentrations above their respective GWQS other than low levels (generally single digit) of benzene slightly above its GWQS of 1 ug/L.
- Specifically, well SC-01 is located within the Pit itself. Analytical data from well SC-01 has indicated no adverse impact to groundwater with respect to any of the PAH, PCB, or VOC constituents with all concentrations below their respective GWQS, including benzene which has historically been reported at levels slightly above its 1 ug/L standard but which has been consistently below 1 ug/L during the past three years of annual groundwater monitoring.
- Not surprisingly, the naturally-occurring metals that are abundant at this former Iron ore mine based on the native bedrock mineralogy, most notably iron and manganese, are reported in groundwater at concentrations which are elevated in comparison to background levels due to the absence of dissolved oxygen (i.e. reducing geochemical conditions) likely driven by oxidation of the organic matter within the Pit--- wood, tree limbs, leaves, etc.

    - These reducing groundwater conditions result in higher iron and manganese levels than background levels which return to within the range of natural background as groundwater flows downgradient from the immediate Peters Mine Pit Area where oxygen levels in groundwater are replenished and iron and manganese in the groundwater precipitate as solids.

- Groundwater quality immediately downgradient of the Pit indicates residual benzene concentrations that generally range from 5 to 8 ug/L in shallow overburden and bedrock wells, however, the concentrations dissipate downgradient and benzene is not detected downgradient.
- A concentration of benzene that has consistently remained approximately 30 ug/L has been reported in groundwater at the base of the Peters Mine Air Shaft located approximately 50 feet east of the Peters Mine Pit. The base of the Air Shaft at 230 feet is approximately 130 feet deeper than the base of the Pit and both are within the native crystalline bedrock. As previously stated, existing data indicate that the water at the base of the Air Shaft is stagnant and the benzene is not migrating beyond the Shaft as evidenced by bedrock wells installed immediately adjacent to the shaft where benzene has never been detected over the past two years of monitoring. This conclusion is being verified evaluated as part of the Supplement RI activities for Site-Related Groundwater that are currently in progress.
- Delineation of the benzene has been completed based on analytical results from the existing network of overburden and bedrock wells.
- Benzene has not been detected in the surface water or sediment of the adjacent Park Brook nor in surface waters downstream of the Peters Mine Pit therefore there is no groundwater to surface water

pathway and no human health or ecological risk posed by the concentrations of benzene in groundwater in the vicinity of the Peters Mine Pit.

- Additional overburden and bedrock wells exist further downgradient of the Peters Mine Pit Area that serve as an additional layer of "sentinel wells" (i.e. wells located sufficiently downgradient of an area of concern and sufficiently upgradient of a potential receptor to serve as an "advance warning signal") have consistently been clean.
- These "sentinel wells" would be included in the post-remediation groundwater monitoring program included in the scope of both the excavation/disposal and Engineered Cap alternatives. Although not anticipated, data from these wells would provide an advance indication of any change in groundwater conditions that could potentially threaten surface water quality, including the Wanaque Reservoir, or the municipal drinking water wells located to the east of the Reservoir as shown in Figure 1.
- A 30-year post-remediation groundwater monitoring program which includes annual sampling of these "sentinel wells" was included in the remedial action cost estimates for excavation/disposal and Engineered Cap construction as detailed in the FS Report for the Peters Mine Pit.

Cannon Mine Pit:

- The Cannon Mine Pit is approximately 190 feet x 300 feet and a maximum of 60 feet deep and approximately 1.5 acres in size. A generalized Cross-Section of the Pit Area taken from the RI Report (Arcadis Figure 3) is attached for reference to illustrate the configuration of this historic mining feature.
- The results of the RI indicate that surface soil is clean with no exceedances of applicable direct contact soil remediation standards.
- Sporadic, infrequent, and generally low concentrations of various constituents, including metals, PAHs, VOCs, and PCBs have been reported within the soil/fill material within the Pit with no pattern exhibited by the distribution. Concentrations are consistent with the definition of Low Level Threat Waste and do not rise to the level associated with Principal Threat Waste.
- Note that the concentrations of iron or manganese or any of the other naturally-occurring secondary metals are consistent with upgradient background concentrations and are not elevated because groundwater geochemical conditions in the vicinity of the Cannon Mine exhibit oxygen concentrations typical of background levels and these metals are not as soluble under oxidizing conditions as they are under the localized reducing conditions that exist in the immediate vicinity of the Peters Mine Pit or the O'Connor Disposal Area.
- As shown in the Cross-Section, several drums were encountered within the Pit that will be removed by Ford under any of the remedial action alternatives that would be considered for implementation at the Site. No paint sludge has ever been found within the Pit or on the surface of the Cannon Mine.
- The constituents reported within the fill materials pose a potential risk to human health and the environment via the direct contact/ingestion/inhalation pathway therefore remedial action is warranted to address the risk posed by the direct contact pathway.
- Groundwater is not encountered within the Pit at depths that correlate to the soil/fill material but it occurs at depth at the base of the fill near the fill/mine tailings interface.
- Groundwater quality within and immediately downgradient of the Pit indicates no impact to groundwater associated with the Pit, specifically no indication of any organic or inorganic constituents other than various metals, including iron and manganese, at concentrations above background.
- Given that there is no adverse impact to groundwater associated with the Cannon Mine, there is no actual or potential risk to surface water quality in this area and groundwater poses no human or ecological risk.
- Additional overburden and bedrock wells existing further downgradient of the Cannon Mine Pit that serve as an additional layer of "sentinel wells" (i.e. wells located sufficiently downgradient of an area of concern and sufficiently upgradient of a potential receptor to serve as an "advance warning signal") have consistently been clean.
- These "sentinel wells" would be included in the post-remediation groundwater monitoring program included in the scope of both the excavation/disposal and Engineered Cap alternatives. Although not

anticipated, data from these wells would provide an advance indication of any change in groundwater conditions that could potentially threaten surface water quality, including the Wanaque Reservoir, or the municipal drinking water wells located to the east of the Reservoir as shown in Figure 1.

- A 30-year post-remediation groundwater monitoring program which includes annual sampling of these "sentinel wells" was included in the remedial action cost estimates for excavation/disposal and Engineered Cap construction as detailed in the FS Report for Cannon.

O'Connor Disposal Area:

- The O'Connor Disposal Area is approximately 12 acres in size and is located on an existing slope located immediately adjacent to the southeastern side of Peters Mine Road as shown on Figure 1. A generalized cross-section of the O'Connor Disposal Area taken from the RI Report (Arcadis Figure 8) is attached to illustrate that this area is located on a slope that extends from Park Brook up to the edge of Peters Mine Road.
- Groundwater is encountered at varying depths below grade but is generally encountered at the base of the soil/fill material approximately 8 to 10 feet deep.
- Soil and fill material within the O'Connor Disposal Area exhibits sporadic and generally very low concentrations of various constituents, including metals, PAHs, VOCs including varying but generally low levels of BTEX and PCBs. No pattern exhibited by the distribution and concentrations rise to the level associated with Principal Threat Waste.
- As discussed in the RI Report for this area, occasional subgrade pockets and flows of paint sludge were historically encountered in borings conducted within this Area and Ford subsequently excavated and transported for offsite disposal approximately 2,200 tons of paint sludge. Based on soil borings and extensive test pit activities within the O'Connor Disposal Area, the data indicate that chunks and chips of paint sludge are sporadically encountered; however, there is no indication of an adverse impact to soil quality that can be correlated with the occurrence of these chunks or chips.
- The constituents reported in the fill materials pose a potential risk to human health and the environment via the direct contact/ingestion/inhalation pathway therefore remedial action is warranted to address the risk posed by the direct contact pathway.
- The PAHs, PCBs and metals reported in the fill material have a strong affinity for sorption to soil and other organic matter in the subsurface and are generally not highly soluble in water. Although more soluble in water, the concentrations of BTEX reported in the fill are sporadic and, although some exceed soil remediation standards, the exceedances are generally slight.
- Groundwater quality within and immediately downgradient of the O'Connor Disposal Area indicates no impact to groundwater in this area, specifically no indication of any of the PAH, VOC, and PCB constituents reported sporadically in the fill material and only various concentrations of metals, including iron, manganese and occasionally arsenic that are naturally abundant in the native bedrock, at concentrations above background.

    - Elevated concentrations of iron and manganese and the occasional reporting of arsenic slightly above its 8 ug/L GWQS are due to the reducing groundwater conditions caused by oxidation of the organic matter within the fill. The concentrations of these metals return to within the range of natural background as groundwater flows beyond the immediate area and oxygen levels in groundwater are replenished. Under these geochemical conditions, iron, manganese, and any trace arsenic in groundwater will precipitate as solids.

- Given that there is no adverse impact to groundwater associated with the O'Connor Disposal Area, there is no actual or potential risk to surface water quality in this area and groundwater poses no human or ecological risk.
- Despite the findings of the RI that indicate that groundwater quality has been characterized and there is no adverse impact or risk associated with it, additional downgradient wells have been installed at the

request of the agencies to further verify groundwater quality downgradient of this Area between the O'Connor Disposal Area and Sally's Pond located approximately 1,000 feet to the east.

- Additional overburden and bedrock wells existing further downgradient of the Cannon Mine Pit that serve as an additional layer of "sentinel wells" (i.e. wells located sufficiently downgradient of an area of concern and sufficiently upgradient of a potential receptor to serve as an "advance warning signal") have consistently been clean.
- These "sentinel wells" would be included in the post-remediation groundwater monitoring program included in the scope of both the excavation/disposal and Engineered Cap alternatives. Although not anticipated, data from these wells would provide an advance indication of any change in groundwater conditions that could potentially threaten surface water quality, including the Wanaque Reservoir, or the municipal drinking water wells located to the east of the Reservoir as shown in Figure 1.
- A 30-year post-remediation groundwater monitoring program which includes annual sampling of these "sentinel wells" was included in the remedial action cost estimates for excavation/disposal and Engineered Cap construction as detailed in the FS Report for the O'Connor Disposal Area.

In summary, the following key observations are made by the Borough for consideration by the USEPA NRRB:

- There are more than 25+ years of groundwater analytical data generated over the course of the two phases of investigation conducted by Ford which creates a long-term analytical database from which to evaluate concentration trends and monitor existing or potential pathways for any impacts to groundwater at the Site to adversely impact surface water or sediment quality and thus any potential human or ecological receptor.
- This long-term database indicates that the conditions at the Site, including in the immediate vicinity of the Peters Mine Pit where the only adverse impact to groundwater has been documented, are stable and essentially in steady state meaning that there has been no notable changes in groundwater quality over the course of monitoring other than a decrease in benzene concentrations to below its 1 ug/L GWQS at well SC-01 located within the Peters Mine Pit.
- These steady state groundwater conditions enable the reliable future prediction of groundwater quality in the future.
- With current pre-remediation conditions indicating no appreciable adverse impact to groundwater in any of the three land ACs or anywhere else at the Site, evaluation of feasible remedial action alternatives must carefully consider the potential risk of any adverse impact or degradation of groundwater quality during or following implementation of any remedy.
- The evaluation of feasible remedial action alternatives must also carefully consider the physical risks associated with intrusive remedial action alternatives given the long mining history of the Site and the fact that two of the three land ACs (specifically the Peters Mine Pit and the Cannon Mine Pit Areas) were actual mines and historic mine structures and subsurface appurtenances likely remain associated with them. Notably, the width and depth of the Peters Mine Pit poses significant challenges with respect to safely and effectively reaching fill material for removal without placing the safety of workers at extreme risk.
- Groundwater is not used at or in the vicinity of the Site and drinking water is supplied to the residents of the Borough from either the Wanaque Reservoir or from one of six municipal production wells located several miles east of the Site on the eastern side of the Reservoir as shown in the site map provided as Figure 1.
- The results of the RI and the risk assessments for each land AC indicates that neither the Wanaque Reservoir nor the municipal production wells are at risk of any adverse impact associated with groundwater or surface water quality at the Site and the existing network of overburden and bedrock monitoring wells, including "sentinel wells", will be monitored for many years as part of the remedies being considered by USEPA for this Site.
- As previously stated, the remedial action cost estimates for both the Engineering/Institutional Control and Excavation/Disposal categories of remedies included in each of the FS Reports includes 30-years of

post-remediation groundwater monitoring for each of the three land ACs and their associated "sentinel wells".

7.0 EVALUATION OF FEASIBLE REMEDIAL ACTION ALTERNATIVES

There were multiple feasible remedial alternatives evaluated as outlined in the Draft FS Reports for each of the three land ACs, including No Action as a baseline, the use of Engineering and Institutional Controls in the form of access restraints and a Deed Notice, construction of Engineering Controls to prevent direct contact in the form of Engineered Caps along with a Deed Notice, and full excavation and offsite disposal of the soil/fill and/or waste within each area. There were several variations in the Engineered Cap design that were considered, including whether it is a permeable soil cap or an impermeable cap utilizing a clay or similar liner as well as other variations in construction approach. In addition, the construction of a slurry wall for containment of groundwater was also evaluated in conjunction with the use of an Impermeable Engineered Cap at Peters Mine. In-Situ Stabilization was also evaluated for the Peters Mine Pit Area only.

Given the environmental and site-specific physical conditions, the primary goal of protection of human health and the environment, and the other issues that are unique to this Site, there are two general categories of feasible remedial action alternatives that have been given the most consideration in the various discussions that Ford and the Borough have had with the agencies and the various stakeholders. These two categories of remedies include the use of Engineering Controls in the form of an Engineered Cap along with a Deed Notice and Excavation and Offsite Disposal of some or all soil/fill/waste within each land AC.

The following outlines each category of alternative and its specific application to the land AC followed by an overview of the advantages and disadvantages associated with implementation of each alternative. A full discussion and detailed evaluation of the remedial action alternatives are provided in the draft FS reports of each land AC, references for which are provided in Section 6.0.

- **Peters Mine Pit Area-** Impermeable Cap/Deed Notice (Alternative 4B in the FS Report) vs. Complete Excavation & Disposal (Alternative 7 in the FS Report)
- **Cannon Mine Pit Area-** Permeable Soil Cap (Alternative 3 in the FS Report) vs. Complete Excavation & Disposal (Alternative 5 in the FS Report)
- **O'Connor Disposal Area-** Consolidation of Fill into Center of Area & Permeable Soil Cap/Deed Notice (Alternative 4A in the FS Report) vs. Complete Excavation/Disposal/Reuse of Mine Tailings (Alternative 5B in the FS Report).

7.1 Peters Mine Pit Area

A generalized Cross-Section C-C' of the Peters Mine Pit (Arcadis RIR Figure 6) is attached herein for reference to illustrate the physical dimensions of this historic mining feature.

<u>Impermeable Cap/Deed Notice (Alternative 4B)</u>

Advantages:

- Protective of human health: prevents direct contact and therefore addresses the direct contact pathway
- Protective of the environment: prevents contact with ecological receptors/minimizes rainwater infiltration to reduce any leaching to groundwater
- Can be readily implemented in a comparatively short time frame and can be easily blended into surrounding topography
- Engineered soil cap will require importation of fill to raise grade such that the vertical thickness of clean fill will be significantly greater than a traditional two-foot soil cap which addresses the concern raised

by the CAG at the May 10th, 2012 Public Meeting regarding animals burrowing through the clean fill and soil cap into the underlying materials and bringing them to the surface
- Compliant with Applicable or Relevant and Appropriate Requirements (ARARs) under both CERCLA and New Jersey State regulations
- Minimally invasive and minimally disruptive to the community

Disadvantages:

- Approximately 750 truck trips transporting clean fill required to raise grade and construct the final engineered cap but no transport of impacted fill
- Deed Notice restricts use, however, the area can be reutilized if desired—the engineering controls could be designed to restore the area for park use

Complete Excavation & Disposal (Alternative 7)

Advantages:

- Protective of human health and the environment through complete removal and offsite disposal of soil/fill/waste materials in the pit and surrounding area which removes the direct contact exposure pathway and any potential leaching to groundwater
- Enables unrestricted reuse of the Area
- Compliant with ARARs

Disadvantages:

- Excavation raises concern regarding physical hazards to workers due to the significant maximum depth (100 feet below grade) of excavation and uncertain structural stability associated with this historic mining feature
- Disruption of pit materials below the water table will likely cause releases of constituents into shallow and/or deep groundwater that are currently stable and not causing an adverse impact to groundwater under existing, pre-remediation conditions
- Cannot accurately/reliably predict future risk that disruption will worsen groundwater conditions which under pre-remediation conditions are in steady state with minimal benzene concentrations that are not migrating or impacting any human or ecological receptor
- Will require a longer timeframe to implement and complete
- Approximately 7,553 round trips for trucks transporting fill out of Upper and Lower Ringwood and approximately 9,175 round trips for trucks coming in with clean fill to backfill the Pit for a total of approximately 16,708 truck trips associated with this alternative
- Significant increase in vehicular traffic and congestion and significant wear and tear on the roadways in both Upper and Lower Ringwood. Truck routes from the Site to major highways Route 87 and Route 287 are shown on the enclosed site map provided as Figure 1
- Generation of odors and dust during excavation, staging, loading, and transportation of subgrade fill and waste materials
- Increased risk of vehicular/pedestrian accidents and/or fatalities

7.2 Cannon Mine Pit Area

A generalized Cross-Section A-A' of the Cannon Mine Pit (Arcadis RIR Figure 3) is attached herein for reference to illustrate the physical dimensions of this historic mining feature.

Permeable Soil Cap/Deed Notice (Alternative 3)

Advantages:

- Protective of human health: prevents direct contact therefore addressing the direct contact pathway
- Protective of the environment: prevents contact with ecological receptors/minimizes rainwater infiltration to reduce any leaching to groundwater
- Can be readily implemented in a comparatively short time frame and can be easily blended into surrounding topography
- Engineered soil cap will require importation of fill to raise grade such that the vertical thickness of clean fill will be significantly greater than a traditional two-foot soil cap which addresses the concern raised by the CAG at the May 10th, 2012 Public Meeting regarding animals burrowing through the clean fill and soil cap into the underlying materials and bringing them to the surface
- Compliant with ARARs under both CERCLA and New Jersey State regulations
- Minimally invasive and minimally disruptive to the community

Disadvantages:

- Deed Notice restricts use, however, the Area can be reutilized if desired—Engineering Controls could be designed to restore the Area for park use
- Approximately 313 round trips for trucks transporting clean fill required to raise grade and construct the final Engineered Cap but no transport of impacted fill

Complete Excavation & Disposal (Alternative 5)

Advantages:

- Protective of human health and the environment through complete removal and offsite disposal of soil/fill/waste materials in the Pit and surrounding area which removes the direct contact exposure pathway and any potential leaching to groundwater
- Enables unrestricted reuse of the Area
- Compliant with ARARs

Disadvantages:

- Excavation raises concern regarding physical hazards to workers due to the significant maximum depth of excavation and uncertain structural stability associated with this historic mining feature
- Disruption of Pit materials below the groundwater table may cause releases of constituents into groundwater that are currently stable and not causing an adverse impact to groundwater
- Cannot accurately/reliably predict future risk that disruption will worsen groundwater conditions
- Approximately 2,100 round trips for trucks transporting fill out of Upper and Lower Ringwood and approximately 2,100 round trips for trucks coming in with clean fill to backfill the pit for a total of 4,200 round truck trips
- Significant increase in vehicular traffic and congestion and significant wear and tear on the roadways in both Upper and Lower Ringwood. Truck routes from the Site to major highways Route 87 and Route 287 are shown on the enclosed site map provided as Figure 1
- Increased risk of vehicular/pedestrian accidents and/or fatalities
- Generation of odors and dust during excavation, staging, loading, and transportation of sub-grade fill and waste materials

7.3 O'Connor Disposal Area

A generalized cross-section C-C' of the O'Connor Disposal Area (Arcadis RIR Figure 8) is attached herein for reference to illustrate the nature of the fill layering, the steep slope of the fill in relationship to the underlying native soils in the area adjacent to Peters Mine Road, and the immediate proximity to the road.

Consolidation of Fill into Center and Permeable Engineered Cap/Deed Notice Grading (Alternative 4A)

Advantages:

- Protective of human health: prevents direct contact therefore addresses the direct contact pathway
- Protective of the environment: prevents contact with ecological receptors/minimizes rainwater infiltration to reduce any leaching to groundwater
- Enables beneficial reuse of the area based on the flatter top cap design of the engineered cap to enable any future use consistent with zoning and Borough planning for the area
- Can be readily implemented in a comparatively short time frame and can be easily blended into surrounding topography
- Engineered soil cap will require importation of fill to raise grade such that the vertical thickness of clean fill will be significantly greater than a traditional two-foot soil cap which addresses the concern raised by the CAG at the May 10th, 2012 Public Meeting regarding animals burrowing through the clean fill and soil cap into the underlying materials and bringing them to the surface
- Compliant with ARARs under both CERCLA and New Jersey State regulations
- Minimally invasive and minimally disruptive to the community

Disadvantages:

- Approximately 2,098 round trips for trucks to transport clean fill to raise grade and construct the final Engineered Cap but no movement of impacted fill
- Deed Notice Restricts use but area can be reutilized if desired—the engineered cap could be designed to restore the area for future use

Complete Excavation/Disposal/Reuse of Mine Tailings (Alternative 5B)

Advantages:

- Protective of human health and the environment through complete removal and offsite disposal of soil/fill/waste materials in the Pit and surrounding area which removes the direct contact exposure pathway and any potential leaching to groundwater
- Enables unrestricted reuse of the area
- Compliant with ARARs

Disadvantages:

- Excavation raises concern regarding physical hazards to workers due to steep slope and potential for undermining Peters Mine Road
- Disruption of soil/fill materials below the groundwater table may cause release of constituents into groundwater that are currently stable and not causing an adverse impact to groundwater
- Cannot accurately/reliably predict future risk that disruption will worsen groundwater conditions
- Approx. 7,800 round trips for trucks transporting fill out of Upper and Lower Ringwood and approximately 730 round trips for trucks coming in with clean fill to place a soil cover over the cut slope for a total of 8,530 round truck trips. Note that the same number of truck trips through Upper

Ringwood will be required if mine tailings excavated from O'Connor are reused in the Cannon Mine or Peters Mine Pits

- Significant increase in vehicular traffic and congestion and significant wear and tear on the roadways in both Upper and Lower Ringwood. Truck routes from the Site to major highways Route 87 and Route 287 are shown on the enclosed site map provided as Figure 1
- Increased risk of vehicular/pedestrian and accidents/fatalities
- Generation of odors and dust during excavation, staging, loading, and transportation of sub-grade fill and waste materials
- The excavation cut and the resultant deep depression would not be restored to pre-existing grade as part of the remedial action and poses a potential safety risk to residents and visitors to the Ringwood State Park.
- As shown in the enclosed Cross-Section, the fill extends to depths of up to 14 feet below grade immediately adjacent to the Peters Mine Road therefore excavation of this material for removal has the potential to destabilize and/or undermine Peters Mine Road. Long-term stabilization and maintenance of the slope is therefore a significant concern as is the safety of vehicles traveling on Peters Mine Road

In summary, the following key observations are made by the Borough based on the advantages/disadvantages of the Excavation/Disposal and Engineered Cap remedies in comparison to the Borough's objectives for support of USEPA's selection of a remedy for each of the three land ACs as previously outlined in Section 3 of this submission:

- Both alternatives are protective of human health, the environment, the community and its residents based on the only documented risk which is via direct contact/ingestion/inhalation with soil/fill materials within each of the three ACs.
- The Excavation/Disposal remedy has the potential to create risks that do not currently exist at the Site, including physical hazards, odor and dust generation associated with excavation and transportation of waste materials through the community, wear and tear on existing roads, the potential for destabilization of Peters Mine Road (O'Connor Disposal Area only), and physical hazards to workers associated with the depth of excavation within the Pits and the steep slopes within the O'Connor Disposal Area whereas these risks, although present, are significantly less if Engineered Caps are the selected remedy
- Given that both remedies remove the direct contact/ingestion/inhalation risk, there is no adverse impact to groundwater associated with the Cannon Mine Pit or the O'Connor Disposal Area and only minimal benzene concentrations remaining in the immediate vicinity of the Peters Mine Pit with no benzene mass discharge from the Pit itself, there is no Principal Threat Waste within any of the three land ACs, and the use of an Engineered Cap with Institutional Controls is the presumptive remedy for land disposal areas with only Low Level Threat Waste, the data indicate that selection of a remedy other than the use of Engineering and Institutional Controls is not technically justified or appropriate for the documented risks
- Construction of Engineered Caps can be implemented and completely in a shorter timeframe and with significantly less disruption/disturbance to both Upper and Lower Ringwood, significantly less risk of adversely affecting groundwater or surface water quality during or after construction activities, and with significantly less risk to residents, the existing infrastructure, the community as a whole, and to workers implementing the remedy in each of the three land ACs.

8.0 END NOTES

[1]Linda Schaefer is the current Mayor of Ringwood.

[2]John Speer is the current Deputy Mayor of Ringwood.

[3]Ringwood's ownership came through a series of conveyances of various portions of the Site, all of which began with conveyances from Ringwood Realty Corporation, a subsidiary of the Ford Motor Company.

9.0 REFERENCES

ARCADIS, U.S., Inc., October 20, 2011. Revised Feasibility Study – Peters Mine Pit Area, Ringwood Mines/Landfill Site, Ringwood, New Jersey.

ARCADIS, U.S., Inc., January 2012a. Revised Screening Level Ecological Risk Assessment for the Peters Mine Pit Area, Ringwood Mines/Landfill Site, Ringwood, New Jersey.

ARCADIS, U.S., Inc., February 23, 2012b. Revised Remedial Investigation Report for the Peters Mine Pit Area, Ringwood Mines/Landfill Site, Ringwood, New Jersey.

ARCADIS, U.S., Inc., March 24, 2012c. Draft Baseline Human Health Risk Assessment for the Peters Mine Pit Area, Ringwood Mines/Landfill Site, Ringwood, New Jersey.

ARCADIS, U.S., Inc., April 10, 2012d. Draft Remedial Investigation Report for the Cannon Mine Pit Area, Ringwood Mines/Landfill Site, Ringwood, New Jersey.

ARCADIS, U.S., Inc., April 20, 2012e. Draft Baseline Human Health Risk Assessment for the Cannon Mine Pit Area, Ringwood Mines/Landfill Site, Ringwood, New Jersey.

ARCADIS, U.S., Inc., April 23, 2012f. Revised Screening Level Ecological Risk Assessment - Cannon Mine Pit, Ringwood Mines/Landfill Site, Ringwood, New Jersey.

ARCADIS, U.S., Inc., April 23, 2012g. Draft Feasibility Study - Cannon Mine Pit, Ringwood Mines/Landfill Site, Ringwood, New Jersey.

ARCADIS, U.S., Inc., April 19, 2012h. Revised Remedial Investigation Report for the O'Connor Disposal Area, Ringwood Mines/Landfill Site, Ringwood, New Jersey.

ARCADIS, U.S., Inc., April 20, 2012i. Draft Baseline Human Health Risk Assessment for the O'Connor Disposal Area, Ringwood Mines/Landfill Site, Ringwood, New Jersey.

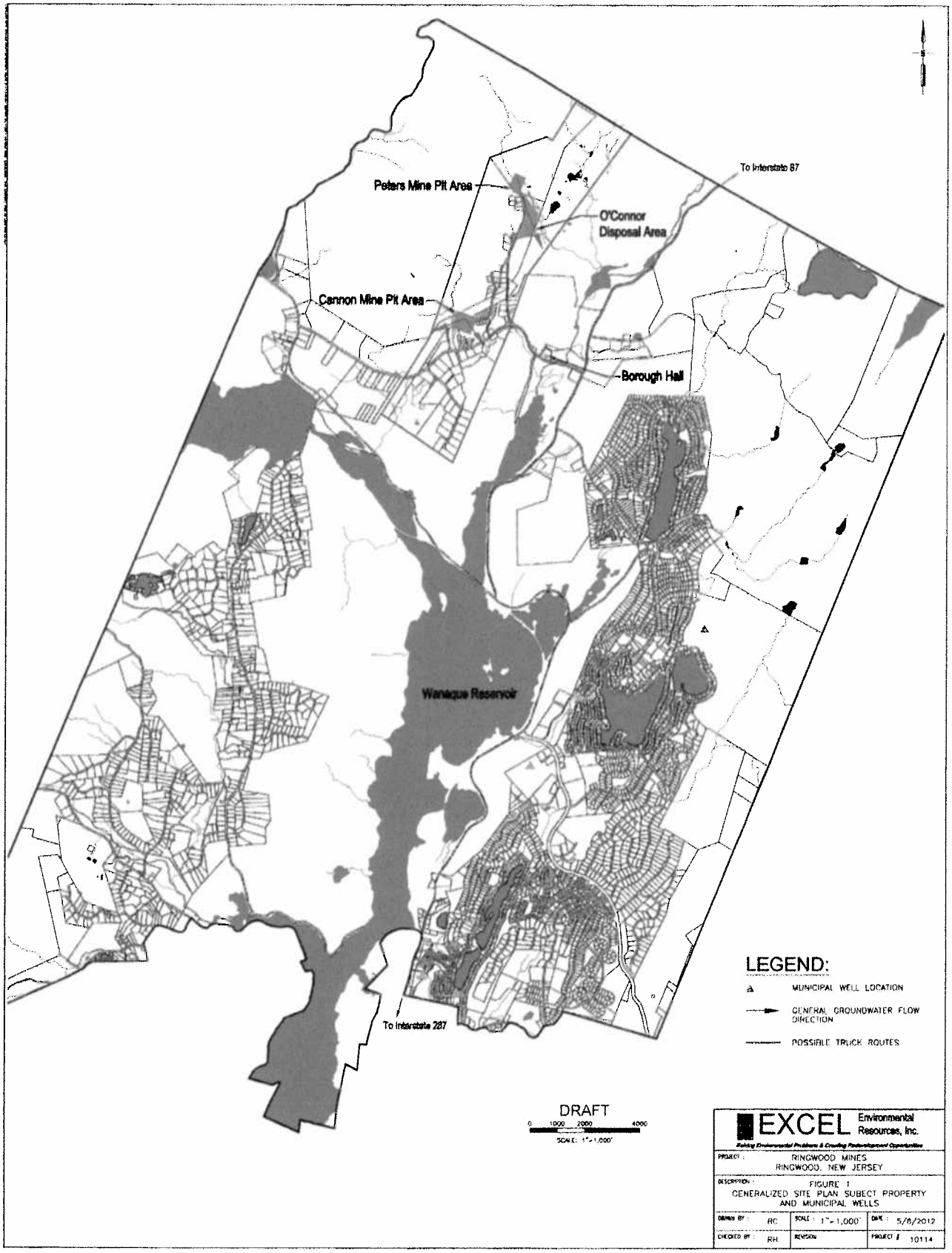
ARCADIS, U.S., Inc., April 25, 2012j. Revised Screening Level Ecological Risk Assessment for the O'Connor Disposal Area, Ringwood Mines/Landfill Site, Ringwood, New Jersey.

ARCADIS, U.S., Inc., May 1, 2012k. Draft Feasibility Study – O'Connor Disposal Area, Ringwood Mines/Landfill Site, Ringwood, New Jersey.

USEPA. 1991. *A Guide to Principal Threat and Low Level Threat Wastes.* OSWER, Superfund Publication: 9380.3-06FS. November 1991. Accessed online at: http://www.epa.gov/superfund/health/conmedia/gwdocs/pdfs/threat.pdf

USEPA. 1997. *Rules of Thumb for Superfund Remedy Selection.* EPA 540-R-97-013. OSWER 9355.0-69. PB97-963301. August 1997. Accessed online at: http://www.epa.gov/superfund/policy/remedy/rules/rulesthm.pdf

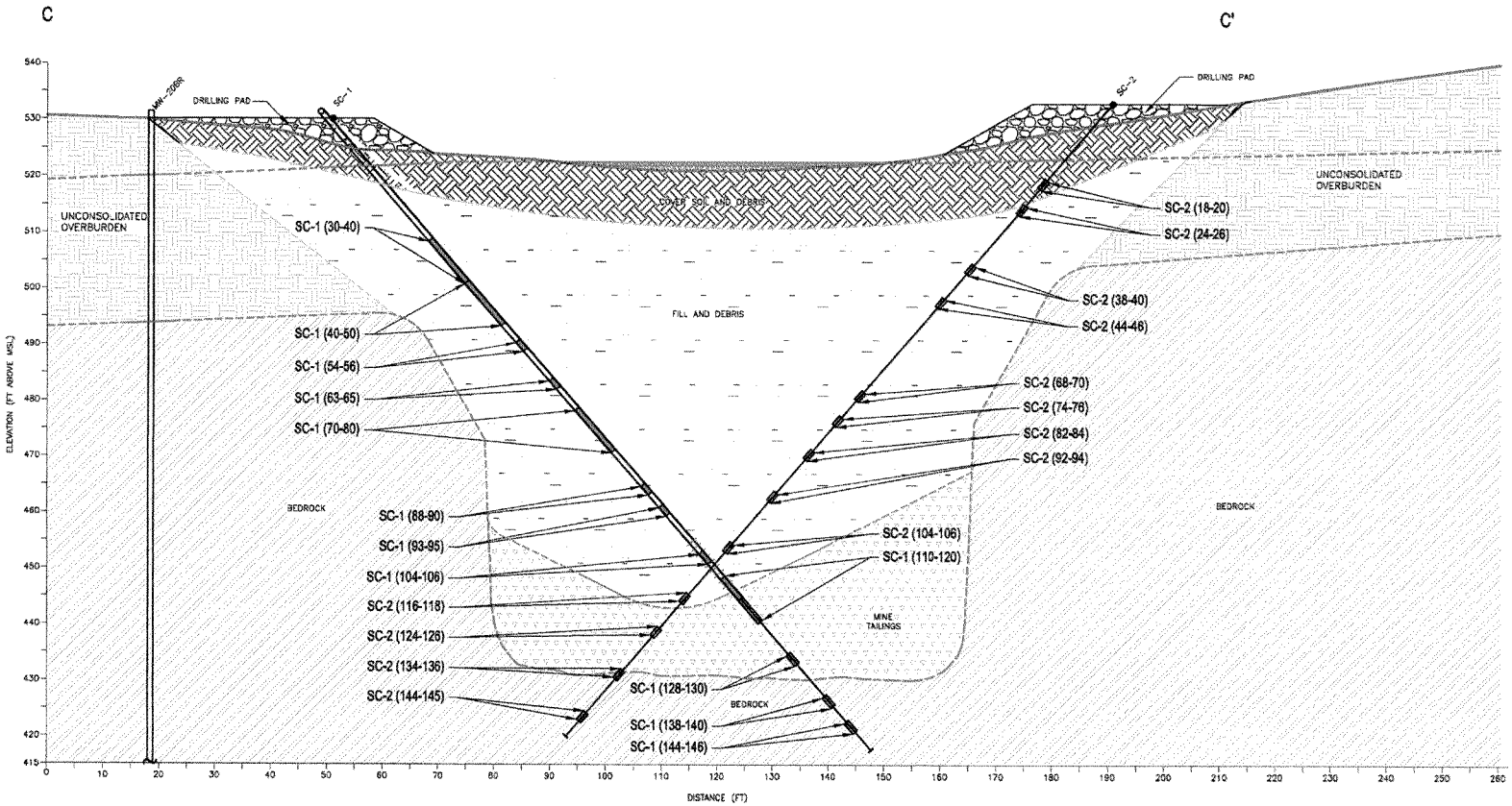
USEPA. 2012. *Presumptive Remedies: CERCLA Landfill Caps RI/FS Data Collection Guide.* Updated. Accessed online at: http://www.epa.gov/superfund/policy/ remedy/presump/caps.htm



EXCEL Environmental Resources, Inc.

Solving Environmental Problems & Creating Redevelopment Opportunities

PROJECT: RINGWOOD MINES, RINGWOOD, NEW JERSEY		
DESCRIPTION: FIGURE 1 GENERALIZED SITE PLAN SUBECT PROPERTY AND MUNICIPAL WELLS		
DRAWN BY: RC	SCALE: 1"=1,000'	DATE: 5/8/2012
CHECKED BY: RH	REVISION:	PROJECT #: 10114



CROSS-SECTION C-C'

SCALE IN FEET

NOTE:

1. DEBRIS INCLUDES CARPET, FOAM, RUBBER, GLASS, WOOD, METAL, FILM, CARTONS, CAR PARTS

SC-1 DIRECTIONAL MONITORING WELL

SC-2 SOIL BORING

WELL SCREEN

SAMPLE ID (DEPTH INTERVAL)

LEGEND:

MSL - MEAN SEA LEVEL

EXISTING GROUND SURFACE

SURFACE WATER (DASHED WHERE INFERRED)

SURFACE OF DEBRIS (DASHED WHERE INFERRED)

SURFACE OF MINE TAILINGS (DASHED WHERE INFERRED)

SURFACE OF BEDROCK (DASHED WHERE INFERRED)

BEDROCK

COVER SOIL AND DEBRIS

FILL AND DEBRIS

GRAVEL

MINE TAILINGS

UNCONSOLIDATED OVERBURDEN

SURFACE WATER

copyright © 2006

REV. ISSUED DATE DESCRIPTION

KEYPLAN

PROJECT TITLE

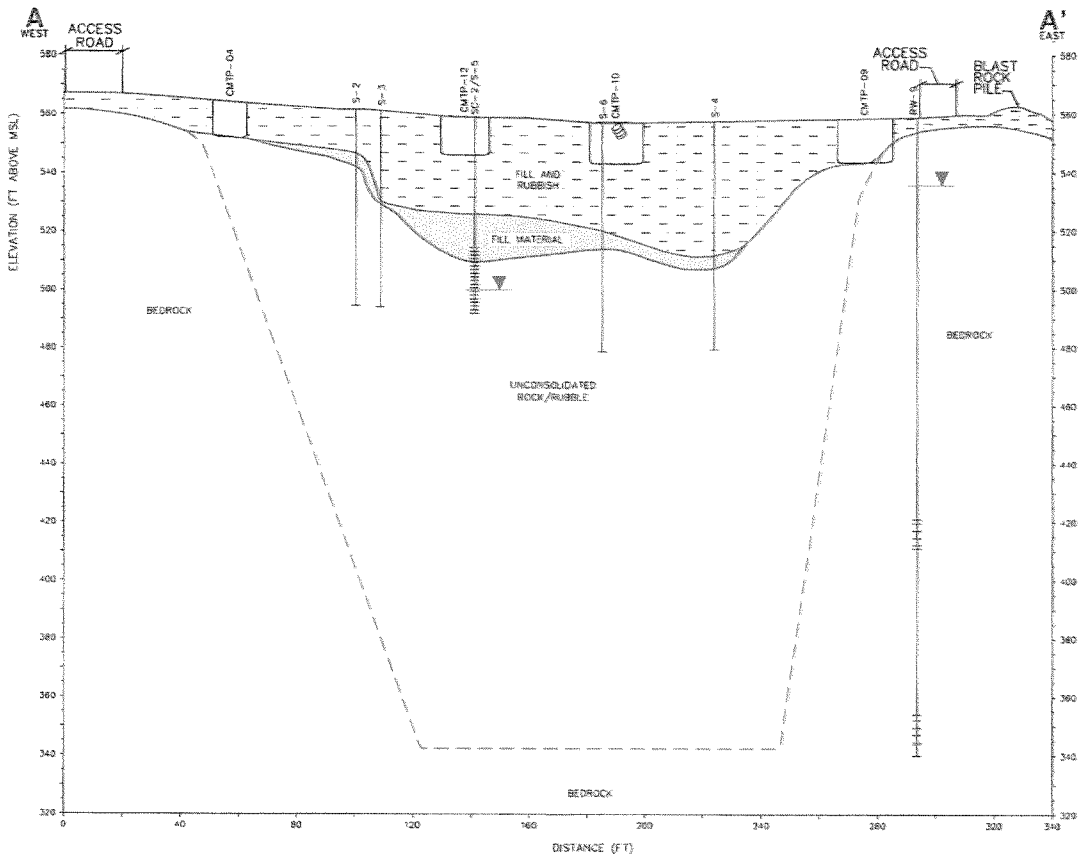
PETERS MINE PIT AREA INVESTIGATION
RINGWOOD MINE/LANDFILL SITE
RINGWOOD, NEW JERSEY

SHEET TITLE

CROSS SECTION C-C'

ARCADIS
1 International Boulevard
Mahwah, NJ 07430
Tel: 201-684-1410 Fax: 201-684-1420
www.arcadis-us.com

SEAL	SEAL
PROJECT MANAGER E. ZIMMERMAN	DEPARTMENT MANAGER E. GARNAHAN
LEAD DESIGN PROF. G. ALBRIGHT	CHECKED BY M. MOHIUDDIN
TASK/PHASE NUMBER NJ001	DRAWN BY J. GONZALEZ
PROJECT NUMBER NJ000604.0014	DRAWING NUMBER 6

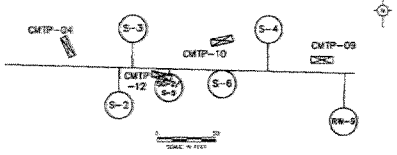


CROSS-SECTION A-A'

HORIZONTAL SCALE 0 20' 40'

VERTICAL SCALE 0 20' 40'

MAP VIEW OF TRANSECT LINE



WELL IDs AND DEPTHS	
ID	DEPTH
S-1	37'-0"
S-2	27'-0"
S-3	87'-0"
S-4	77'-0"
S-5	87'-0"
S-6	77'-0"
SC-2	(47' – 87')
RW-8	216
RW-9	216
RW-10	195

LEGEND:

MSL – MEAN SEA LEVEL

PROJECTED

EXISTING GROUND SURFACE

494.7 SURFACE OF BEDROCK (DASHED WHERE INFERRED)

GROUNDWATER LEVELS FROM JULY 25, 2008

BEDROCK

FILL AND RUBBISH

FILL MATERIAL: SAND, GRAVEL AND FINES

MINE BLAST ROCK

DRUM REMNANT

NOTE:

1. RUBBISH INCLUDES CARPET, FOAM, RUBBER, GLASS, WOOD, METAL, FILM, CARTONS, CAR PARTS

SC-2 MONITORING WELL

WELL SCREEN

BOTTOM OF BORING

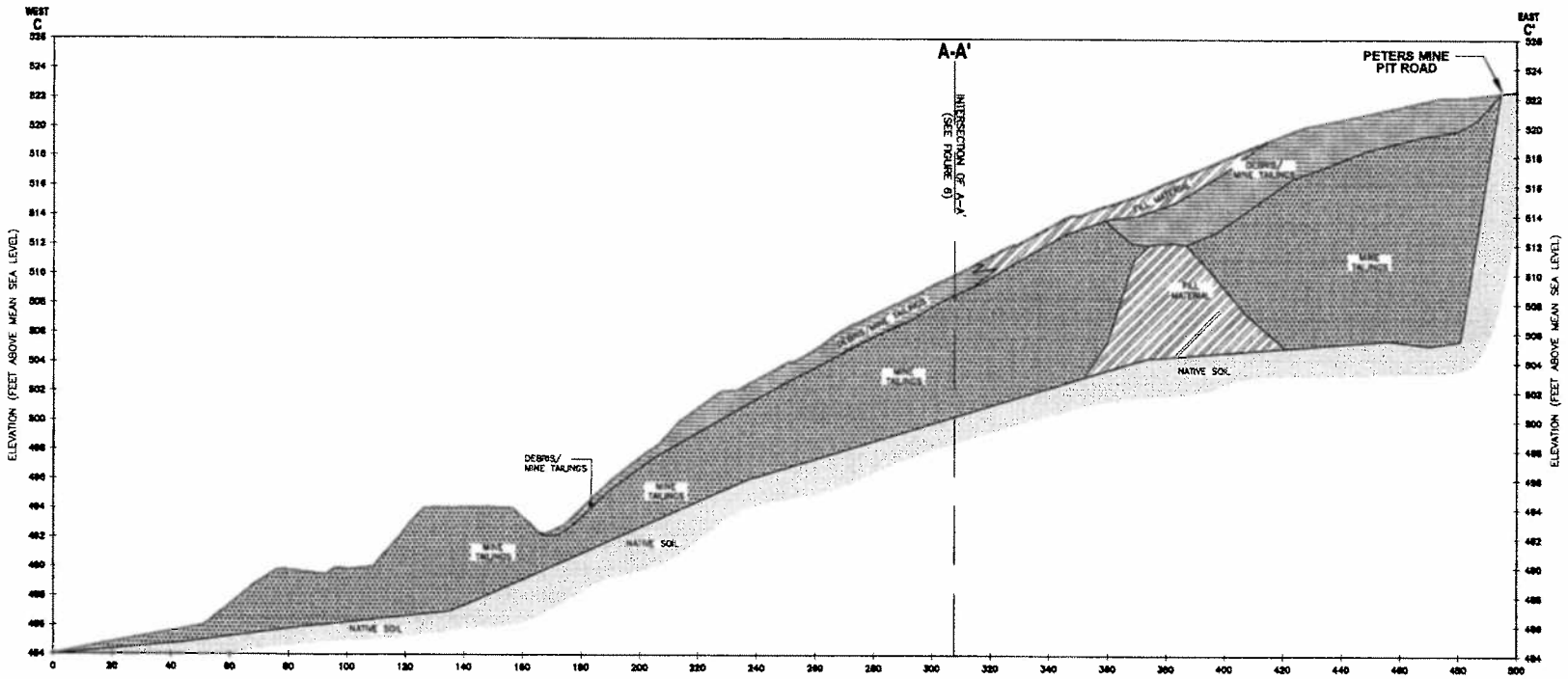
CANNON MINE PIT AREA INVESTIGATION
RINGWOOD MINE/LANDFILL SITE
REMEDIATION PROJECT,
RINGWOOD, NEW JERSEY

CROSS SECTION A-A'

ARCADIS

FIGURE 3

CITY:MAHWAH DIV/GROUP:ENVIRONMENTAL DB:J.GONZALEZ LD:J.SEIER PIC:M.MONSISON PM:E.ZIMMERMAN TM:(0%) LYR:(0)K0FH=*;OFF=*REF*
G:\ENVCAD\Mahwah\ACTIVE\B0080400\B0080401\FIG-03-CROSS SECTION A-A'.dwg LAYOUT:3 SAVED: 4/8/2012 7:43 PM ACADVER: 17.1S (LMS TECH) PAGESETUP:---- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 4/8/2012 10:21 AM BY: WASILEWSKI, MATT
XREFS: IMAGES: PROJECTNAME: ----



CROSS SECTION C-C' (C-C'0+00 TO C-C'-5+00)

LEGEND:

- GROUND SURFACE
- FILL MATERIAL
- DEBRIS/MINE TAILINGS
- MINE TAILINGS (GRAVEL, SAND & SILT SIZED ROCK FROM ORE PROCESSING AND MILLING)
- NATIVE SOIL

NOTE:

1. LITHOLOGY OF MATERIAL SHOWN ARE BASED ON INVESTIGATION TEST PITS/TRENCHES AND THE INTERPRETATION THEREOF.

0 40
HORIZONTAL SCALE: 1" = 40'

0 8
VERTICAL SCALE: 1" = 8'

KEYMAP

RINGWOOD MINES/LANDFILL SITE
RINGWOOD, NEW JERSEY
FEASIBILITY STUDY REPORT
FORMER O'CONNOR DISPOSAL AREA

O'CONNOR LANDFILL FOCUS AREA
CROSS SECTION

ARCADIS

FIGURE
8

OFFICE OF THE MUNICIPAL CLERK
973-475-7102

"48 HOUR NOTICE OF COUNCIL MEETING"
THE OPEN PUBLIC MEETING LAW
PL. 1975 Ch. 231

PLEASE TAKE NOTICE that pursuant to N.J.S.A. 40:69 A-179, Mayor Linda M. Schaefer does hereby call a Special Meeting on Thursday, May 10, 2012 at 7:30 pm at the Violet E. Bogert Municipal Annex, 60 Margaret King Avenue, Ringwood, NJ for the following purpose:

> Lawra Dodge, President of Excel Environmental Resources and Wanda Chin Monahan, Esq., partner with McManimon & Scotland, will make a presentation to provide an overview of the choice of remedies being considered by the EPA for the Peter's Mine Pit Area, Cannon Mine Pit Area and the O'Connor Disposal Area of the Ringwood Mines/Landfill Superfund Site. They will explain what the remedy choices are and the pros and cons of each remedy.

FORMAL ACTION WILL NOT BE TAKEN.

KELLEY A. ROHDE, RMC
BOROUGH CLERK

FOR IMMEDIATE RELEASE:
The Trends
The Bergen Record
WGHT
Channel 77
Bulletin Board-VEB Annex

c: Hon. Mayor and Council
Municipal Manager
Municipal Attorney
Municipal Auditor
Municipal Engineer

Dated: May 3, 2012