BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
PROPOSED AMENDMENTS TO CLEAN	)	
CONSTRUCTION OR DEMOLITION	)	**R12-9**
DEBRIS FILL OPERATIONS (CCDD):	)	(Rulemaking – Land)
PROPOSED AMENDMENTS TO 35Ill.	)	
Adm. Code 1100	)	

COMMENTS BY MICHAEL RAPPS ON BEHALF OF IRON HUSTLER EXCAVING, INC.

Introduction

My name is Michael Rapps. I am a graduate of the University of Illinois in Champaign-Urbana. I hold a Bachelor's degree in GeneralEngineeringand l am a Registered Professional Engineer. I have worked in the solid waste field since 1972, first with the Illinois Environmental Protection Agency (IEPA), later with Waste Management, Inc., and subsequently as President and CEO of Rapps Engineering and Applied Science, Inc., a Springfield based consulting firm. My resume is included herein as Attachment No. 1.

In connection with my work at IEPA's Division of land Pollution Control (ne: Bureau of Land)I reviewed permit applications for dozens of municipal solid waste (MSW) landfills, as well as applications for construction and demolition (C&D) waste landfills. At one point I was also responsible for reviewing all of the groundwater monitoring data associated with all Illinois landfills. I have worked in or am otherwise familiar with most counties in the state.

My client, Iron-Hustler Excavating, Inc., a Peoria based construction, excavation and demolition contractor, asked that I review and comment on the proposed rulemaking. Although admittedly late in the game, I am hopeful that the Board will consider my commentary in its deliberations in this matter.

History of Solid Waste Regulation in Illinois

Refuse disposal in Illinois was first regulated by the Illinois Department of Public Health's (IDPH) April, 1966 issuance of "Rules and Regulations for Refuse Disposal Sites and Facilities."

The rules were rudimentary at best, but even so, they recognized the distinction between putrescible household waste and construction debris. Rule 5.11 from the 1966 regulations states:

> **SANITARY LANDFILL VARIATION.** Large quantities of non-combustible and non-putrescible waste such as boiler house cinders, broken paving, or materials resulting from construction or demolition operations may be disposed of at a sanitary landfill by open dumping. Such material shall be leveled and spread at sufficient intervals to prevent unsightly appearance or rodent harborage, and shall be finally covered as required for a completed sanitary landfill in Rule 5.07, unless approved plan provides for other cover.

Per the 1966 regulations, landfills were not required to obtain permits but rather could simply register with IDPH. Many Illinois landfills, even though they might have opted to accept MSW, chose to accept only C&D waste. The distinction, as a mindset, is intuitive. Construction and demolition landfills are not perceived as odorous, are not subject to severe settling, are not as offensive to neighbors, and don't carry the stigma associated with "garbage dumps."

When IEPA was organized in 1970, following the Illinois constitutional convention of the same year,the newly formed Agency assumed the regulatory duties formerly held by IDPH. In 1972, IEPA proposed new solid waste regulations that would later replace the IDPH rules. The new regulations were subsequently adopted by the IPCB, effective July 27, 1973. They required that all existing landfills obtain an IEPA permit within one year of the effective date. Eventually hundreds of Illinois landfills obtained permits, some for MSW, some for C&D waste, and others for singleindustry specific wastes such as sludge, incinerator ash, or others.Historic records from my files, taken from an October 15, 1983 IEPA data summary, show that at that time Northern Illinois had 213 operating landfills, not all of which were permitted.Of these sites,67 (31%) were characterized as C&D sites.

ln 1990, the IPCB adopted new solid waste regulations (Part 810) that incorporated strict requirements for leachate and gas management, groundwater monitoring, and other features associated with modern landfills. Existing landfills were given a grace period in which to either obtain an updated permit, or to close. Most closed. The Part 810 regulations didn't specifically address C&D waste but rather introduced, as a concept, "inert waste", and set forth associated inert waste landfill requirements. Unfortunately, time has shown inert waste to be more an academic notion than a reality. To my knowledge, there are currently no inert waste landfills in Illinois. This is because the definition of inert waste requires that its leachate meet an unattainable drinking water standard.

In 1994 USEPA published a survey of the number of C&D landfills in the states and U.S. Territories (Eastern Research Group, 1994). Data supplied by IEPA reported Illinois to have three (3) C&D landfills. The same survey listed as an example (among others) Florida with 277

C&D landfills, Ohio with 148,Kentuckywith 143, and Minnesota with 79. But, neighboring Iowa reported only one (1) C&D landfill. One might suspect that this disparity among the states stemsfrom differences in the defining of terms. It is unclear as to just whathas replaced thedozens of Illinois C&D landfills that existed in the 1980's, and the C&D waste that they used to manage.In that tipping fees at MSW landfills now generally exceed thirty (30) dollars per ton, a rate thatdemolition contractors might generally seek to avoid, and that most down-state Illinois communities do not have nearby CCDD sites, it is not difficult to imagine that CCDD (or C&D waste), in much of Illinois,has occasionally found its way into forbidden territory.

In presenting the subject proposal the Agency notes that there now exist 48 CCDD sites in 26 counties, and 20 uncontaminated soil sites in 10 counties. This is another way of saying that ***there are no CCDD sites in 76 Illinois counties, and no uncontaminated soils sites in 92 Illinois counties***. Moreover, most of the existing sites, of either variety, appear to be clustered in metropolitan Cook and surrounding counties. Few such sites can be found south of Interstate 80.

Construction and Demolition Waste

Although C&D landfills seemingly vanished from the Illinois landscape they have returned, in part,under the headings of CCDD and uncontaminated soil. Although an abundance of research exists regarding the chemical composition of MSW leachate, leachate data from C&D sites is somewhat sparse. What does exist is probably not applicable to CCDD because, other than asphalt, CCDD does not contain the materials that contribute most of the objectionable compounds found in C&D leachate (i.e., VOC's heavy metals, plasticizers, etc.). However, Townsend (1999) has reported that concrete waste can generate a leachate pH in excess of 11.0.This, it might be assumed, couldaffect the water solubility of naturally occurring inorganic compounds at a CCDD site.

Available literature suggests that C&D sites should monitor groundwater for the same parameters found in MSW leachate. Studies show that the same organic and inorganic compounds found in municipal solid waste facilities are also found in C&D landfills, albeit in differing orders of magnitude. But, CCDD and uncontaminated soils sites are apparently unique to Illinois. Leachate data, if it exists for these sites, is not easily found. But, it easy to envision CCDD or uncontaminated soil sites having an effect on the dissolved solids (TDS) content of groundwater. The same is true of the pH of groundwater, in the case of CCDD sites that accept large volumes of concrete. Asphalt contributions to the leachate are difficult to forecast, especially since PAH components in asphalt have low water solubilities and would have limited mobility when entombed in a fill.

Urban Soils

Chicago soils have received a large share of attention,mostly because they contain residues of industrialization, and as is often reported,residues from the Great Chicago Fire of 1871. But, Chicago is hardly alone in displaying the effects of urbanization. The soils in Illinois' older cities

are replete with debris associated with the mere fact that they exist in cities.Established communities have survived floods, fires, storms, demolitions, and cyclical economic fluctuations. The soils in these communitiesreflect the effects of newer buildings built atop the remnants of older buildings. And, so on.

The earliest communities in Illinois were settled along the river systems in areas that are now essentially cities built atop cities. In river towns much of the sub-surface consists of fill material, predominantly native soil, but inclusive of bricks, stone, cinders, and other inorganic debris. This condition is present in the populous metro-east area, in the Peoria-East Peoria-Pekin areas, in the Quad Cities, in Rockford, in Sterling-Rock Falls, and others.The same is often true of inland communities in the State's heartland. While these urban soils might be defined in any number of ways, to the residents of Illinois' urban areas, the earth beneath their homes and businesses is not contaminated soil, it is ***terra firma***.

Chicago

Chicago offers anexcellent case study. The great fire consumed most of the city, leaving behind a host of polynuclear aromatic hydrocarbons (PAH's) that were formed through the incomplete combustion of wooden structures. Subsequent burning of wood, coal, and trash, road construction, motor vehicle operation, manufactured gas plants, steel mills, etc. have similarly contributed to PAH levels in the soils. This is true in all major cities. Chicago soils also display elevated concentrations of heavy metals that can be associated with urbanization. One example is lead. Elevated levels of lead, apart from those directly relating to smelters or other industrial activity, are thought to stem from historic vehicle emissions from leaded gasoline, or the demolition of structures that contained leaded paint.

In 2001, the United States Geological Survey, in cooperation with the Chicago Department of Environment (Kay, et. al., 2001-02) performed a comprehensive study of Chicago soils, analyzing for both PAH's and inorganic compounds. The study identified that lead levels were approximately 20 times higher than in typical soils in outlying areas and that many other metals were two (2) to eight (8) times higher. PAH levels are such that the soils often do not meet the Illinois Tiered Approach to Cleanup Objectives (TACO) guidelines for disposition of excavated material. Thus, such soils are sometimes sent to MSW landfills rather than used as structural fill at other locations. Naturally, this adds considerable cost to developers and contractors.

Pekin

Pekin is located in Tazewell County, south of Peoria,on the opposite side of the Illinois River. It is an industrial community that has hosted a number of factories and production plants over its existence. Like many river towns in Illinois, low areas of Pekin have been built up with fill material, considered clean fill at the time of its placement. The local extent of this is shown in Attachment No. 2,a contour map placed atop an excerpt from a USGS topographic site. It shows the contoured thickness of fill material near an Iron-Hustler project site in Pekin. The fill

material, which is principally silty and clayey sand with brick shards and some cinders, is as much as twenty-five (25) feet thick. Atop the fill are industrial structures, residential neighborhoods, and even state highway Illinois Route 29. Additionally, water wells placed through this fill and into underlying alluvial sand and gravel are used for private water supply, the water quality of which meets food supply standards. Moreover, chemical analyses of the Pekin fill for inorganic constituents fall within the range of published data. The fill material in this instance is the *terra firma* of Pekin, Illinois. Notwithstanding, and as codified per these proposed regulations, IEPA is contendingthat the *terra firma* of Pekin is a "waste" if excavated at a construction site and reused off site as (i.e.) road base. The rather bizarre implications of this view are obvious and should be alarming to the Pekin community, some members of which could soon learn that the soil in their backyards has been declared not uncontaminated (i.e., contaminated). Respectfully, this Board should also be alarmed.

At issue is the theory expressed in the Agency's Statement of Reasons (page 19) that "Moreover, soil with contaminants above the Tier I residential values is considered waste that must be properly disposed of if excavated." This sums up the long held notion, espoused by many in the Agency, that any soil that is excavated and moved automatically enters the realm of "waste." R12-9 simply adds a chemical component to the mix. Logic eludes this proposition.

Illinois

IEPA's Office of Chemical Safety issued a Technical Report in August 1994 (OCS, 1994) that summarized the results of sampling and analyses for common inorganics, including heavy metals, in surface soils sampled throughout the state. Samples were taken in all of 102 counties. The report organized the resulting data into two groups, the statewide statistics, and the Metropolitan Area statistics. This data, rearranged to reflect sampling from either inside or outside of Standard Metropolitan Areas (SMAs), appears to be the basis for Appendix A, Table G, in part 742 (TACO). This plays in to cross references in the subject proposal that serve as a means to define Maximum Allowable Concentrations of Chemical Constituents in Uncontaminated Soil Used as Fill Material at Regulated Fill Operations (MACs). For example, the 1994 OCS summary identifies the **median** level of cadmium in 243 soil samples from throughout the state as being 0.5 mg/kg; the median value of 104 soil samples in metropolitan Statistical Areas is given as 0.6 mg/kg. Said same values then appear in part 742 TACO, Appendix A, Table G, and now in the proposed list of MACs. This is a seriously flawed construct because it ignores one half of the background data, that one half that exceed the statistical **median** value.

The actual range of cadmium concentrations in Illinois surface soils, as reported in the 1994 OCS report, is from ND (non-detect) to 8.2 mg/kg, for both Illinois soils and SMA soils. Consequently, a soil sample containing a cadmium concentration of 8.0 mg/kg would be within the range of observed background data but, per the proposed list of MACs, would be an indication of not uncontaminated (i.e., contaminated) soil, with all of the consequences, and

expense, that attach to that finding. Cadmium is only an example. The same problem exists with other inorganics in the MAC list, and possibly with the organic compounds as well.

Use of TACO to Define Contaminated

I must agree with those commenters who have observed that TACO was never intended to be used as a means to define "contaminated' (or not uncontaminated). TACO is counter-intuitive such that meeting a chemical objective confers only that that particular chemical does not pose a risk for a given pathway. That said, I am also sympathetic with the Agency insofar as TACO is the only quantitative arrow in its quiver. And, I will acknowledge that TACO is often used as a bright-line test by cleanup contractors, generally as negotiated by parties in a real estate transaction. But, may I suggest that there are qualitative means to arrive at a conclusion of uncontaminated as required by statute. That is, virgin soil, the product of God and the glaciers, as some in the Agency often invoke, should be sound enough evidence that a soil material, not otherwise spilled upon, etc., is uncontaminated.

Recommendations:

1.) I am hopeful that the Board will agree that the range of organic and inorganic compounds found as a background condition in Illinois soils is just that. It is not a cherry-picked statistic, not the median, nor the mean, and not the 75th percentile. The background condition is what it is.

2.) I recommend that the Board take into consideration the utter chaos that will unfold state-wide should it enact the regulations as now proposed and cause wide swaths of urban areas of Illinois to reside in not uncontaminated (i.e., contaminated) soils, with all of the implications affixed thereto. A recommended fix to this dilemma is to recognize the concept of ***terra firma***, the existing soils of urban areas that have not been the subject of LUST releases, chemical spills, aerosol releases, etc. In short the soil upon which people live, work, play, etc.

3.) Chicago is special example for application of the *terra firma* principle. Millions have lived, worked, played, gardened, inhaled dust, etc. in the conditions that exist in the City Chicago for more than a century. Yet, there is no evidence presented in the subject proceedings that Chicago soil has harmed anyone. As suggested in the preceding point, the *terra firma* of Chicago, that is not impacted by spills, LUST releases, etc., like elsewhere, should be exempt from the proposed regulations.

4.) I agree that groundwater should be monitored at CCDD sites and Uncontaminated Soil sites. However, the list of monitored parameters should be reduced to include only those parameters that might reasonably be expected to be found in the respective facilities. Analysis for the full suite of 620 compounds is something of a fishing expedition in which the only certainty is great expense.

5.) Soil analyses for the complete list of 620 compounds is similarly excessive, especially in light of load checking and other cross-checks. It should be possible to arrive at a shortened list of indicators that would dramatically reduce the expense of testing but achieve the same result.

6.) The Board should consider revisiting the concept of "inert waste" in that it dovetails somewhat with what IEPA is attempting to accomplish with R12-9.

7.) It is easy to predict that R12-9, if adopted as now proposed, will generate unforeseen complications and expense, especially in downstate urban areas such as Champaign-Urbana, the Quad Cities, Peoria, Springfield, Decatur, and the Metro-East. Should the Board decide to proceed on course to adopt R12-9, I would urge that the Board ask DCEO Director, Warren Ribley, to reconsider his decision to forego an economic impact study.

Citations

Eastern Research Group, Inc., List of Industrial Waste Landfills and Construction and Demolition Waste Landfill, U.S. Environmental Protection Agency, PB95-208914, 530-R-95-019, September 30, 1994

Kay,Robert T., Arnold, Terri L.,Cannon, William F.,Graham, David, Morton, Eric, and Bienert, Raymond, Concentrations of Polynuclear Aromatic Hydrocarbons and Inorganic Constituents in Ambient Surface Soils, Chicago, Illinois: 2001-02, Water-Resources Investigations report 03-4105, Urban, Illinois, 2003

Office of Chemical Safety, A Summary of Selected Background Conditions for Inorganics in Soil, Illinois EPA, August, 1994

Townsend, T.G., Jang,Y., and Thurn, L.G., Simulation of Construction and Demolition Waste Leachate, Journal of Environmental Engineering, 125, 1071, 1999

Respectfully submitted;

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EDUCATION:

B.S. General Engineering, University of Illinois at Champaign-Urbana, Illinois, 1972.

Graduate Study- Operations Research/Systems Analysis, 1973-75, Sangamon State University, Springfield, Illinois.

REGISTRATION:

Professional Engineer - Illinois No. 62-35299

ORGANIZATIONS:

Illinois Environmental Review Commission (since 1999)
Capitol Area Development Association, Board of Directors (since 1999)
Nature of Illinois Foundation Board (since 1997)
Low-Level Radioactive Waste Task Group (since 1996)
Illinois Petroleum Marketers Association (since 1992)
American Society for Testing Materials (since 1978)
Association of Groundwater Scientists and Engineers (since 1977)
National Solid Wastes Management Association, Chemical Waste Committee (1977-1979)
Illinois Electroplating Waste Task Force – Co-founder (1975-1978)
Chicago Industrial Water, Waste and Sewage Group (1974-1978)

PROFESSIONAL POSITIONS:

August, 1978 - Present: President, Rapps Engineering, Springfield, Illinois.

December, 1999 – Present: Appointed to the Illinois Environmental Regulatory Review Commission. Responsibilities include recommendations to legislature for improving and streamlining statutes and regulations.

December, 1998 – Present: Appointed to state government transition team, responsibilities include implementation of environment and natural resource policies.

August, 1998 – 2002: Commissioner, Central Midwest Interstate Low-Level Radioactive Waste Commission.

August, 1996 - Present: Voting member of Illinois Low-Level Radioactive Waste Task Group; Senate appointee.

November - December, 1980: Special consultant to the World Health Organization, Pan American Division, Rio de Janerio, Brazil.

September 1977 - August, 1978: Technical Director, Chemical Waste Management, Inc., Division of Waste Management, Inc., Oak Brook, Illinois.

November 1977: Special consultant to the World Health Organization, Pan American Division, Sao Paulo, Brazil.

September 1975 - September 1977: Manager Hazardous Waste Unit, Division of Land Pollution Control, Illinois EPA, Springfield, Illinois.

October 1975: Special consultant to U.S. EPA on industrial/hazardous waste, Nashville, Tennessee.

September 1973 - September 1975: Staff engineer, Permit Section, Division of Land Pollution Control, Illinois EPA, Springfield, Illinois.

September 1972 - September 1973: Staff engineer, Field Operations Section, Division of Land Pollution Control, Illinois EPA, Springfield, Illinois.

June, 1972 - September 1972: Staff engineer, Field Operation Section, Division of Public Water Supply, Illinois EPA, Springfield, Illinois.

EXPERIENCE:

Illinois Low-Level Radioactive Waste Task Group (1996 to present)

Illinois State **Senate** appointee to this seven member group charged with developing criteria to be used in selecting a low level nuclear waste disposal site for the Illinois-Kentucky Nuclear Waste Compact. Group is also charged with the responsibility for providing oversight of the Illinois Department of Nuclear Safety and its contractors during the site selection process.

Rapps Engineering and Applied Science (1978 to present)

Founded Rapps Engineering & Applied Science (RAPPS) in 1978, a thirty-plus member consulting firm with annual sales at approximately $2M. Firm deals with all manners of environmental engineering problems, including civil, chemical, and geo-technical components. Specialties include solid waste (i.e., landfill design, investigation, monitoring, etc.) hydrogeology, regulatory affairs (i.e., permitting, etc.), site investigations and remediation and related matters. Clientele include commercial solid and industrial waste management companies, mining companies, manufacturers, state, county, and municipal agencies, lending institutions, real estate and developers, and other engineering or legal consultants.

Personal specialties include the subject of waste management, hydrology, and hydrogeology; as well as performance and supervision of subsurface investigations, groundwater modeling exercises, and other such studies related to Comprehensive Emergency Response & Compensation Liability Act (CERCLA), Resource Conservation & Recovery Act (RCRA), Leaking Underground Storage Tank (LUST), and solid/hazardous waste projects. Project areas include the Midwest, Northeastern U.S. and abroad with extensive experience in the State of Illinois, including the following Illinois counties:

Adams	Alexander	Brown	Bureau	Carroll	Cass
Coles	Clark	Cook	Douglas	Fulton	Greene
Henry	Jasper	Jefferson	Jersey	Jo Daviess	Kane
Kendall	Knox	Lake	LaSalle	Lawrence	Lee
Logan	Macon	Macoupin	Madison	Marion	Massac
McLean	Mercer	Morgan	Montgomery	Ogle	Peoria
Perry	Randolph	Richland	Saline	Rock Island	Sangamon

Schuyler	Shelby	St. Clair	Tazewell	Vermillion	Wayne
Whiteside	Williamson	Winnebago			

Pan American Health Organization (November 1977)

Special consultant to FEEMA, an environmental regulatory authority equivalent to the US EPA, for the State of Rio de Janeiro, Brazil. Worked with and lectured FEEMA staff concerning industrial waste problems in Rio State. The mission's purpose was to foster an understanding of the subject that would allow FEEMA staff to develop plans and regulations to control industrial waste disposal. A report with recommendations was issued subsequent to the mission.

Surveyed industrial waste problem for the State of Sao Paulo, Brazil. Prepared a comprehensive industrial waste regulatory plan for CETESB a Sao Paulo EPA equivalent. Lectured and instructed CETESB staff.

Chemical Waste Management, Inc. (1977-78)

Technical director with responsibility for design, development, and operational plans for company's chemical waste facilities in North America. Made recommendations to corporate officials relative to prospective acquisitions. Represented the company on National Solid Waste Management Association's Chemical Waste Committee concerning RCRA rulemaking. Served as company spokesman at various public hearings concerning special or hazardous rulemaking at the Federal level and for various states throughout the U.S. Also worked on the development of Chemical Waste Process Systems, acquisitions, permits, etc. in approximately 20 states.

Illinois Environmental Protection Agency (IEPA),Hazardous Waste Manager (1975-77)

Authored most of "Illinois Special Waste Hauling Regulations".
Defined term "Special Waste".
Reviewed all data resultant from the Illinois EPA groundwater monitoring program for landfills; keyed follow-up investigations.
Emergency Action Coordinator for chemical spills, pipeline breaks, etc.
Reviewed all permit applications for special or hazardous waste disposal.
Served as IEPA representative in Washington D.C. on a working group charged with development of RCRA regulations.
Refined Illinois Supplemental Permit System for special waste disposal.
Developed Illinois database concerning land based industrial waste disposal.
Co-Founder of an Illinois task force on the matter of electroplating waste.
Originated development of an IEPA "standard leaching test"; a modified form for the test was later incorporated into RCRA rules by the U.S. EPA.
Spearheaded an IEPA policy to assist in creating sufficient disposal capacity to service State industry.

Special Consultant to U.S. EPA ("Advisor on loan") (1975)

Visited State offices in Nashville, Tennessee, with a US EPA staff member to investigate industrial waste disposal problems in the State as part of pre-RCRA efforts to cause passage of the RCRA.

IEPA, Staff Engineer, DLPC Permit Section (1973-77)

Reviewed approximately one hundred facility permit applications for solid waste disposal sites. Examined engineering, geologic, and hydrogeologic aspects of several hundred land disposal sites. Served as an IEPA witness in Illinois Pollution Control Board proceedings relative to permit appeals and enforcement actions.

IEPA, Staff Engineer, DLPC Field Operations Section (1972-73)

Assistant to the Section Manager responsible for supervision of approximately twenty field investigators. Conducted site visits with staff for purposes of improving performance. Also served as Division data processing coordinator responsible for data gathering and the generation of data summaries.

IEPA Staff Engineer, DPWS Field Operations Section (1972)

Inspected public water supplies and issued follow-up reports relative to facility features and compliance with applicable regulations.

Representative Projects:

Designed groundwater-monitoring systems for numerous landfills and waste storage sites throughout Illinois.

Designed, sited, and permitted a major regional landfill in southern Illinois. Site is equipped with a dual liner (clay-geomembrane); a 99.9% efficient leachate collection system with dual-lines leachate storage with spill protection and splash pads. Site has dozens of groundwater monitoring wells and gas monitoring ports.

Expert opinion report in the Matter of U.S. v Gerald Lippold, et. al. in the U.S. District Court for the Central District of Illinois (Criminal Number 06-30002). Subject area US Clean Water Act, NPDES permit, boron, flyash, Rapanos. August, 2007

Expert witness in a dispute involving groundwater conditions in a stone quarry in north-central Illinois.

Investigated contamination of groundwater by organic chemicals near a waste oil storage facility in Northern Illinois.

Investigated groundwater contamination at a landfill site in southwestern Illinois (American Bottoms) situated in an aluminum by-product waste pile.

Investigated groundwater contamination from large surface impoundments of a pesticide manufacturing facility in East-Central Illinois.

Investigated possible groundwater contamination at numerous Illinois landfills.

Investigated possible groundwater contamination at several "Superfund" sites in Northern Illinois.

Investigated the impact on groundwater quality by a large coal stockpile in southern Illinois.

Investigated regional groundwater conditions in the area of a proposed surface mine (coal) in Central Illinois.

Prepared three RCRA permit applications (groundwater portions) for two hazardous waste landfills in Illinois and one in Iowa.

Represented the IPMA on the Illinois LUST advisory group, the Illinois Brownfields task force, and the IEPA Risk-Based Corrective Action (RBCA) advisory panel.

Performed groundwater flow and/or transport models for RCRA permits, RI/FS investigations, IEPA landfill permits, IEPA LUST investigations, and for Brownfields.

Rapps, Michael W., Dipanjan Ghosh, and Maria Ray, Geo-Hydrology of the Banner Area, Fulton County, Illinois, September, 2009

Rapps, Michael W., Expert Opinion Report in the matter of United States of America v. Gerald Lippold, Curry Ready Mix & Builders Supply, Inc., etc. et. al., U.S. District Court for the Central District of Illinois, Criminal No. 06-30002, 2007

Rapps, Michael and Ghosh, Dipanjan, Investigation of Reported Impairment, Canton Lake, Fulton County, Illinois, September 2008

Rapps, Michael, Ghosh, Dipanjan, Mantha, Rashmi, and Miller, Kenneth, Groundwater Protection in the Illinois Coal Region, Grant No. 04-48318, Illinois Department of Commerce and Economic Opportunity, December, 2005

Rapps, Michael, Ghosh, Dipanjan, and Ray, Maria, Geo-Hydrology of the Banner Area, Fulton County, Illinois, Prepared for Capital Resources Group, LLC in connection with a Section 404 permit, for presentation to the US Corps of Engineers, Rock island District, September, 2009

Testified on behalf of the Illinois Pork Producers Association with respect to proposed regulations regarding groundwater monitoring at wastewater lagoons associated with hog farms.
Technical advisor to the Illinois Petroleum Marketers Association (IPMA), devised LUST cleanup standards for the organization in 1994 that were adopted as an interim rule by the Illinois Pollution Control Board. The interim regulation was the predecessor of permanent risk-based soil and groundwater cleanup standards (i.e., TACO).

PRESENTATIONS, PUBLICATIONS AND SPECIAL PROJECTS:

May, 1977, Waste Age, exclusive interview with Michael W. Rapps, Manager, Hazardous Waste Sub-Unit, Illinois E.P.A.

Rapps, Michael W., October, 2002, Reported Bird Strikes at Down State Illinois Airports, Bird Strike Committee USA – Canada, Sacramento, California

Rapps, Michael W., Environmental Forensics at a Landfill in Northern Illinois, March 27, 2002, presented to the Central Great Lakes Geologic Mapping Coalition, Peoria Forum, Peoria, Illinois.

Rapps, Michael W., 1996, Environmental Issues Survey, The Illinois Manufacturer, survey of 200 Illinois manufacturers.

Rapps, Michael W., and Ronald R. Dye, CPG, 1996, LUST – Brownfields Update, Illinois Municipal Review, Trade Journal of the Illinois Municipal League.

Rapps, Michael W. and Larry Eastep, (IEPA), H. Walton (IL Power) and J. Van der Kloot (Chicago Dept. of Environment) et al., 1996, Changes to the Illinois Pre-Notice Program, February 7, 1996 panel discussion in Oak Brook, IL, at 1996 Air & Waste Management Conference by the Lake Michigan States Section of the Air & Waste Management Association.

Rapps, Michael W., 1995, Landfilling in the 1900's, The Illinois Manufacturer, trade journal of the Illinois Manufacturers Association.

Rapps, Michael W., 1995, Illinois Storage Tank Update, The Oil Can, trade journal of the IPMA.

Rapps, Michael W., 1994, RBCA at LUST Sites, seminar on IPCB LUST rulemaking held in Springfield, Mt. Vernon, and Rosemont Illinois.

Rapps, Michael W., 1994, Risk-based Cleanup Standard for Illinois LUST sites, designed a risk-based method to calculate soil cleanup standards for petroleum leaks for the IPMA; presented at a public hearing held by the Illinois Pollution Control Board (IPCB). The method was adopted by the IPCB as an interim regulation in September 1994.

Rapps, Michael W., 1990, CERCLA, Phase I's and Investments, presented to the Sangamon Valley Estates Council in Springfield, IL.

Rapps, Michael W. and J. Jacoby, P.E., 1987, Regulatory Impediments to the USE of Coal Wastes, for the Illinois Department of Energy and Natural Resources.

Rapps, Michael W., 1980, Special Waste Management, lecture given to environmental regulatory staff of FEEMA (EPA equivalent) in Rio de Janeiro, Brazil.

Rapps, Michael W., 1979, Surface Impoundments for Industrial Wastes, University of Wisconsin – Madison, Instructor for Engineering Extension Course in "Hazardous Waste Management Practices".

Rapps, Michael W., May 4, 1978, E.P.A.'s Hazardous Waste Regulatory Program and State Regulatory Policy for Implementation of Federal Hazardous Waste, panel discussion at the International Waste Equipment and Technology Exposition, Miami Beach, Florida.

Rapps, Michael W., 1978, Special Waste, presented at George Williams College, Oak Brook, Illinois, to engineers attending a course sponsored by the publication Pollution Engineering.

Rapps, Michael W., 1978, Special Waste Problems: Sludge – Hazardous and Toxic, presented to the Chicago Industrial Water, Waste and Sewage Group.

Rapps, Michael W., 1977, Earthline – Case Study, panel discussion given at the Sixth National Conference on Waste Management Technology and Resource and Energy Recovery

Rapps, Michael W., 1977, What is a Hazardous Waste?, presented at the Sixth National Conference on Waste Management Technology and Resource and Energy Recovery, Washington, D.C.

Rapps, Michael W., 1977, Special Waste Management in Illinois, thirty minute live radio interview on station WVEM, Springfield, Illinois.

Rapps, Michael W., 1977, Implementation of a Disposal Permit System in Illinois, presented at the University of Wisconsin Extension's "Hazardous Waste Management II Conference".

Rapps, Michael W., 1977, Industrial Wastes and Political Contaminants, presented at the Investment Recovery Conference, Travenol Laboratories, Deerfield, Illinois.

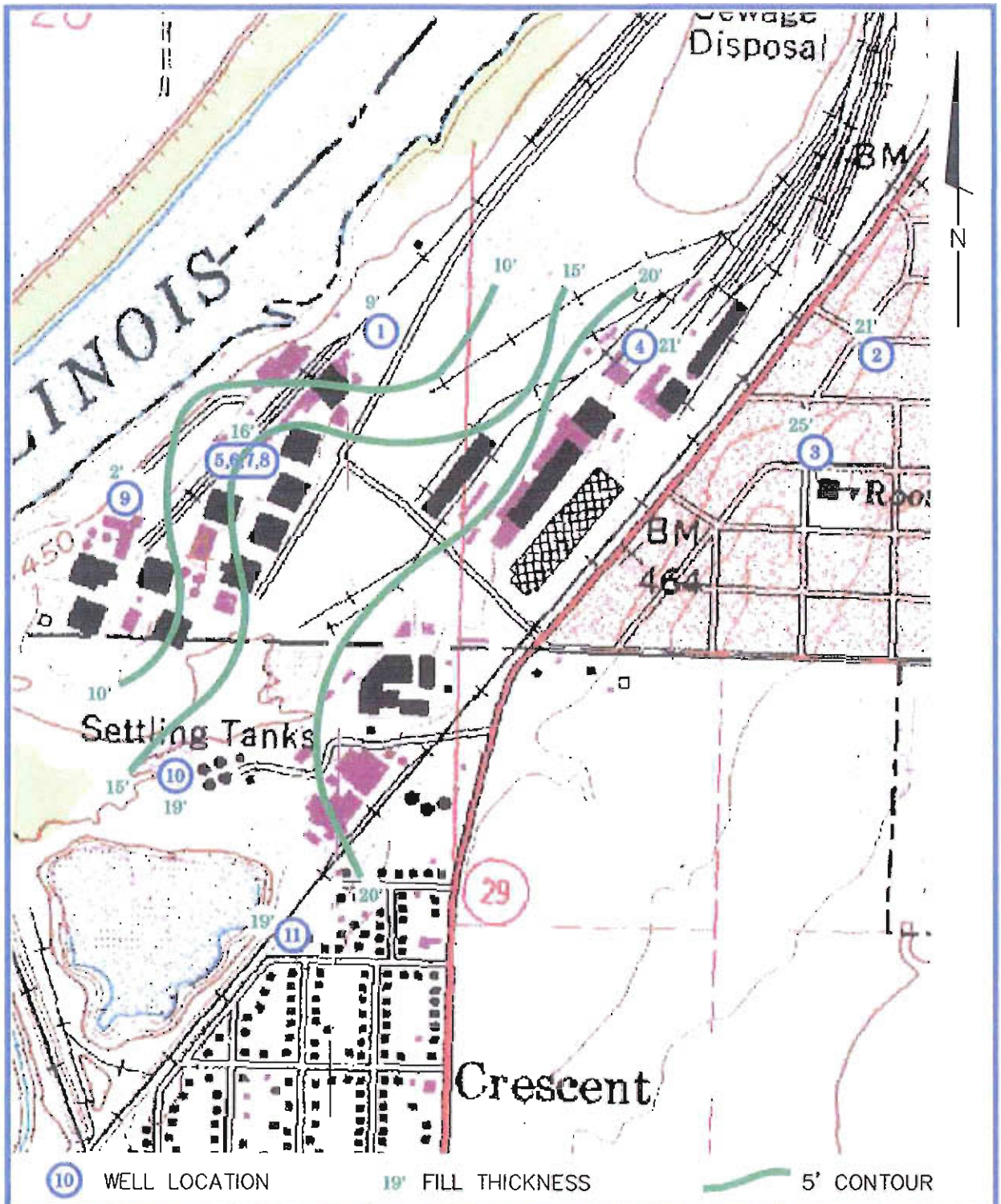
Rapps, Michael W., 1977, P.C.B. Disposal at Wilsonville, Illinois, public statement and press release given in Wilsonville, Illinois.

Rapps, Michael W., 1977, Industrial Waste in Illinois, presented at the University of Minnesota's 23rd Annual Wastes Engineering Conference.

Rapps, Michael W., 1976, Solid and Semi-Solid Waste Disposal, presented to the Chicago Industrial Water, Waste and Sewage Group.

Regional and Urban Design Assistance Team (R/UDAT). Mr. Rapps has worked ***pro bono*** the American Instituute of Architects (AIA) R/UDAT in its work with the City of Springfield Illinois, beginning in 2002.

Sustainability Recommendations for the City of Fort Worth, Texas, ***Pro bono*** team member with the American Institute of Architects (AIA) Sustainability Design Assistance Team (SDAT) November,2008. Team members were Jane Jenkins (Boulder, Co.), Prescott Gaylord (Baltimore, Md.), Kathryn Schiedermayer (Madison, Ws.), Jame Sherrell, AIA (Chattanooga, Tn.), Sabrina Carr (Hampton, Va.), and Darren Smith (Washington, D.C.). Report issued May, 2009



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Attachment No. 2

FILL THICKNESS

IN THE VICINITY OF
PEKIN, ILLINOIS

RE: HOPEDALE / CLOUSE

PROJECT: SA08028 DRAWING: CCDD DATE: 04/2008