



Wellhead Protection Ordinance Evaluation

Tri - County Regional Planning Commission
Planning Practicum: Spring 2011

*Jon Benaderet, Kellie Green, Tyler Klifman, John
Pickering, Ryan Soucy, and Yue Zhang*

TABLE OF CONTENTS

Aknowledgements	1
Executive Summary	2
Summary	2
Findings	3
Introduction	4
Client	4
Goals	4
Methods of Analysis	4
Deliverables	6
Wellhead Protection Overview	7
Federal and State Regulations	9
Regional and Local Regulations	10
Current Groundwater Trends	12
Statewide	12
Tri-County Region	13
Abandoned Wells	14
Individual Community Reports Overview	16
Wellhead and Groundwater Protection Audit Tool	16
Introduction	16
Organization and Content	16
Geographic Information Systems Data	17
Wellhead Protection Areas Map	19
Summary of Wellhead and Groundwater Protection Audit Tool Results	20
Regional Findings	24
Delhi Charter Township	26
Findings and Recommendations	27
Wellhead and Groundwater Protection Audit Tool Results	29
Mapped Wells (all)	37
Mapped Wells (plugged since 2005)	38
Delta Charter Township	39
Findings and Recommendations	40
Wellhead and Groundwater Protection Audit Tool Results	42
Mapped Wells (all)	50
Mapped Wells (plugged since 2005)	51
City of East Lansing	52
Findings and Recommendations	53
Wellhead and Groundwater Protection Audit Tool Results	55
Mapped Wells (all)	62
Mapped Wells (plugged since 2005)	63
City of Lansing	64
Findings and Recommendations	65

Wellhead and Groundwater Protection Audit Tool Results	67
Mapped Wells (all)	75
Mapped Wells (plugged since 2005)	76
Lansing Charter Township.....	77
Findings and Recommendations	78
Wellhead and Groundwater Protection Audit Tool Results	80
Mapped Wells (all)	88
Mapped Wells (plugged since 2005)	89
Meridian Charter Township	90
Findings and Recommendations	91
Wellhead and Groundwater Protection Audit Tool Results	93
Mapped Wells (all)	101
Mapped Wells (plugged since 2005)	102
Comparative Case Study: Battle Creek, MI	103
Wellhead Protection Planning	103
Procedures and Enforcement.....	103
Education and Outreach	104
Information Sharing and Data Management.....	104
Appendix I: Glossary	
Appendix II: Blank Audit Tool	
Appendix III: Community assessments	
Appendix IV: Zoning Maps	
Appendix V: Interviews	
Appendix VI: Best Management Practices	
Appendix VII: Environmental Permits Checklists	
Appendix VIII: Ordinances	
Appendix IX: Mark Wyckoff's Original Recommendations from 2000	
Appendix X: References	

ACKNOWLEDGEMENTS

This report was compiled by students of the Planning Practicum, Wellhead Protection Ordinance Evaluation Group; a team consisting of five undergraduate students and one graduate. This program is accredited by the Planning Accreditation Board. Urban Planning Practicum is a required course for graduation and is an essential step in bridging the gap between educational knowledge gained in the classroom and real-world planning issues. In order to complete this project, the team worked with a variety of professionals throughout mid-Michigan that provided assistance with the team's findings. The practicum team was guided by the Michigan State University faculty and the Tri-County Regional Planning Commission.

The Wellhead Protection Evaluation Group would like to acknowledge the following individuals for their time, effort, knowledge, and support necessary for completing this project:

Gary Bozek, AICP, Senior Planner, *Delta Charter Township*

Matt Brinkley, AICP, Senior Planner, *Lansing Charter Township*

Rick Brown, AICP, Associate Planner, *Meridian Charter Township*

Erin Campbell, Environmental Planning Technician, *Tri-County Regional Planning Commission*

Dana DeBruyn, Regional Environmental Health Technician, *Barry-Eaton District Health Department*

Christine Kosmoski, Wellhead Protection Representative, *City of Battle Creek*

Dr. Zenia Kotval, Practicum Professor, *Michigan State University*

Dr. Rex LaMore, Practicum Professor, *Michigan State University*

Cheryl Loudon, *Lansing Board of Water and Light*

Bill Maier, *Lansing Board of Water and Light*

Tracy Miller, AICP, Director of Community Development, *Delhi Charter Township*

William Rieske, AICP, Assistant Planning Manager, *City of Lansing*

Christine Spitzley, Environmental Programs Planner, *Tri-County Regional Planning Commission*

Timothy Schmitt, AICP, Community Development Analyst, *City of East Lansing*

Mark Wyckoff, FAICP, *Planning & Zoning Center at Michigan State University*

EXECUTIVE SUMMARY

The Wellhead Protection Ordinance Evaluation Team, as a part of Michigan State University's Urban and Regional Planning Practicum, has compiled an analysis of wellhead protection planning for the major municipalities in the Tri-County area of mid-Michigan. The project includes the analysis of six target communities; the Charter Townships of Delhi, Delta, Lansing, and Meridian and the Cities of Lansing and East Lansing.

These six municipalities were chosen for review by the Tri-County Regional Planning Commission; selection of communities was based on a previous analysis of wellhead protection efforts, completed by the Planning and Zoning Center in 2000. An analysis of each target area's relevant community documents (master plans, zoning ordinances, site plan review processes, and supplementary documents) were reviewed with specific recommendations for improving wellhead protection plans and regulations.

The goal of this project was to review and re-evaluate the relevant community documents within the six Tri-County target communities to assess the effectiveness and implementation of their wellhead protection programs (WHPPs) to date. Analyzing the evolution of these documents allowed the MSU Wellhead Protection Ordinance Evaluation Team to assess the initial development of wellhead protection programs, their current state, and to develop the framework for providing of recommendations for future implementation.

The primary objective of this project was to obtain all of the most current community documents that pertained to wellhead and groundwater protection. From here, an evaluation tool was developed to assess these relevant documents and compare and contrast them in a uniform method. This assessment tool was modeled after several other audit tools for planning and zoning as well as watershed protection in order to ensure that the most effective and comprehensive instrument was created.

The tool that was produced (referred in the report as the Wellhead and Groundwater Protection Audit Tool) was been developed to assess these six specific communities (townships of Delhi, Delta, Lansing, and Meridian, and the cities of Lansing and East Lansing) within the Tri-County area for their application of contemporary regulations and standards as they apply to wellhead and groundwater protection. This audit tool can also be applied to other communities throughout the nation who are looking to evaluate their wellhead and groundwater protection strategies. These communities were evaluated in four aspects important to the wellhead protection planning process; the identification of goals and objectives for improving or maintaining groundwater quality, the identification of specific strategies that will allow the community to meet their stated goals and objectives, an examination of ordinances pertaining to groundwater protection, and an analysis of strengths, weaknesses, opportunities, and threats (SWOT analysis) to aid in the identification of barriers and to gauge potential room for improvement.

This report provides a comprehensive analysis for the implementation of WHPPs in the target communities within the Tri-County region. This includes an evaluation of official documents and interviews with local administrators, as well as a comparative case study of similar region in Michigan. For the client, recommendations were developed in order to update existing wellhead protection efforts in each municipality, create a uniform standard and promote best management techniques.

Findings:

There are various specific recommendations used to enhance wellhead protection planning in the six target communities. These recommendations are based off findings from the audit tool as well as further expert interviews and research. These recommendations include improvements for deficiencies in relevant community documents (master plans, zoning ordinances, site plan review processes, and supplementary documents) as well as improvements for the procedures, enforcement, outreach, education, and regional efforts necessary for comprehensive wellhead protection planning.

After reviewing and evaluating each of the six communities' approaches to groundwater and wellhead protection efforts, general recommendations were made for improvement. Each community had specific strengths and weaknesses, but all failed to meet certain criteria. With the adoption of the following, general recommendations, communities will be able to develop more comprehensive, uniform standards for groundwater and wellhead protection.

Update Contingency Plans:

Emergency response is imperative for the prevention of serious contamination. Without adequate plans to deal with these situations, there can be detrimental effects to ground water and wellhead protection areas. Also, clean up efforts can become increasingly expensive as time goes on. Also, fire response must have knowledge of locations with hazardous material in order to handle emergencies correctly. Inadequate emergency response control can cause contamination to runoff into groundwater and potentially pollute drinking water.

Maintain Current GIS Data on Groundwater:

Current and regularly updated groundwater information is important in the maintenance of the community's water quality. Without regular ground water monitoring, issues can arise that would have a much greater impact than if acknowledged early on. Furthermore, contamination that is found early will greatly decrease the impact it has on surrounding areas. It is important to maintain these practices of regular upkeep of groundwater data to be knowledgeable of arising issues. Examples of data pertinent to wellhead protection planning includes: locations of all wells including unplugged wells, aquifer models, and locations of wellhead protection areas.

Encourage Best Management Practices:

Best management practices are important for the everyday protection of groundwater resources. These practices can be encouraged through media campaigns, public awareness and education programs, as well as by word of mouth. Best management practices are important for mitigation and prevention of potentially hazardous and costly environmental risks. In this case drinking water is at risk of contamination. Local officials can encourage best management practices to assist with preventative wellhead protection planning.

INTRODUCTION

The Client

The client for the Wellhead Protection Evaluation Project was the Mid-Michigan's Tri-County Regional Planning Commission (TCRPC) based in Lansing, Michigan, which serves Clinton, Eaton, and Ingham Counties. TCRPC strives to support local professional planning by providing technical and collaborative assistance. Specific to this project, the TCRPC is involved with various environmental planning initiatives including regional wellhead and groundwater management efforts.

"The mission of the Tri-County Regional Planning Commission is to provide professional planning, coordinating and advisory services to local governments, state and federal agencies and the public in order to preserve and enhance quality of life in Mid-Michigan."

Goal

The main goal of this practicum project is to review the relevant community documents for the Charter Townships of Delhi, Delta, Lansing, and Meridian and the Cities of Lansing and East Lansing to assess the effectiveness and implementation of wellhead protection programs (WHPPs). Analyzing these documents allowed the Team to assess the initial development of WHPPs, their current state, and provided a basis for developing individual recommendations for future implementation.

Methods of Analysis

A variety of research methods were employed in order to attempt an accurate and comprehensive overview of wellhead protection planning.

Qualitative research approach:

In order to deal with the multiple social and environmental factors that are inherent in locally based environmental protection initiatives such as WHP planning, a qualitative research approach was used for this study. Qualitative research allows the investigator to focus on the research topic as a holistic entity, with an emphasis on the interactions of each component of the topic being studied. Rather than relying on empirical formulas, qualitative researchers strive to identify the individual's perspective through observation and detailed examination (Denzin and Lincoln, 2000).

Qualitative research provides an opportunity for the investigator to study and understand complex social issues and interactions. However, because qualitative research is by its very nature interpretative research, the researcher's biases, values and judgment may influence the study conclusions (Creswell, 1994). While it may be difficult to establish the reliability of the qualitative research results, it is argued that qualitative research should be judged as credible and confirmable with appropriate and reliable research (Merriam, 1998). Although challenges with generalizing exist with this mode of research, the benefits associated with qualitative research validate its use.

Research strategies in qualitative research often involve examining case studies and observing participants in the field, while data collection methods include interviewing and observing

individuals and analyzing documents and records related to the issue being examined. All of these strategies are utilized in the completion of this project.

Case study research:

A comparative case study approach was utilized for this project, including the six noted communities (Delhi Charter Township, Delta Charter Township, the City of East Lansing, the City of Lansing, Lansing Charter Township and Meridian Charter Township). An integral component of qualitative research includes the expansion of knowledge on each cases background, physical setting, and contextual issues. By employing a case study method, researchers are able to provide insight into an issue and to develop generalizations about the study topic (Stake, 2000). Because case studies emphasize the context around which the issue is framed, the researcher is able to develop valuable analysis of the case being studied.

Disadvantages to case study research also exist. Because case studies rely on personal interpretation of the research findings, the researcher may introduce subjectivity into the research report. In addition, it may be difficult to test the validity of the results. However, with evidence and analysis, case study research can provide valuable insight.

Procedures used in this investigation:

1. *Face-to-face interviews:*

Interviews were used as the primary data collection strategy for this study. The principal advantage of interviews is that they allow the researcher to focus directly on the case study topic, and provide depth to the research findings. However, bias can be introduced via poorly designed questions, and inaccuracies may result due to poor recall or reference by the researcher. Structured interviews utilize a series of pre-established questions with a limited set of response categories, while the unstructured interview is designed to provide a greater depth and breadth of understanding (Fontana and Frey, 2000). Structured interviews were conducted for this study, whereby a series of questions were developed that allowed for some categorization of answers as well as open-ended responses. These interviews were then used to compare and provide analysis for further recommendations.

Planners from each of the selected six communities were interviewed. These individuals are designated in handling wellhead protection issues for their communities in collaboration with the TCRPC. In addition, environmental planners and consultants, Lansing Board of Water and Light representatives, health department representatives, and a wellhead protection representative from the City of Battle Creek were interviewed in order to conduct a complete and comprehensive analysis.

There are difficulties in this procedure as well as with any other research method. Some of the inconsistencies may result from time constraints, unavailability of interviewees and interviewers, slow response to follow-up, as well as question misinterpretation.

2. *Review of archival documentation:*

Reviewing documentation to augment information obtained through the interview process has several advantages. The process is unobtrusive, and allows the researcher to work at his own pace to collect and analyze the information. The stability of the information allows it to be repeatedly viewed, and a broad array of information can be tapped. Disadvantages of this data collection method include the possibility that bias

may be introduced through selectivity, and access to particular records may be deliberately blocked.

For this project, the zoning ordinances, master plan and other adopted plans, as well as site plan review documents for each of the six selected communities were reviewed and evaluated. These documents are public and accessible. In order to create a standard for reviewing these documents an audit tool was developed. The Wellhead and Groundwater Protection Audit Tool helped group members to evaluate each of the community's relevant documents on a standard basis. The audit tool provided evaluation questions which were then referenced using the designated documents.

3. Methods utilized to ensure validity of the data:

The process of triangulation was employed in this study to help ensure the validity of the research results. This process relies on multiple modes of data collection in order to overcome any inherent biases in the data sources, with the investigator or research method (Creswell, 1994). Data collection and analysis methods used in this study included interviews with individuals from the WHP communities, discussions with state, regional and WHP experts, personal observation within the communities, review of archival documentation, and peer consultation. The findings as a result of these methods were then reviewed by professional colleagues to ensure the validity of the research results.

This cross examination was necessary for an inclusive analysis and proper utilization of the audit tool. The questions in the audit tool help to clarify and provide a basis for wellhead protection planning. Therefore, all of the questions could not be answered successfully by simply relying on interviews with professionals or by review of relevant documents. A combination of both helps to ensure the collection of up to date and accurate data. This triangulation provides a kind of check and balance system on both kinds of data sources.

Deliverables

This report provides a comprehensive and specific analysis for the implementation of wellhead protection planning in the designated communities within the Tri-County region. This includes an evaluation of official documents and interviews with local administrators, as well as comparative case studies of similar regions in Michigan. Furthermore, a Wellhead and Groundwater Protection Audit Tool was developed for generally evaluating WHPP. For Tri-County, recommendations were developed to update existing wellhead protection efforts in each specific municipality.

Wellhead Protection Overview

It is imperative to understand the process of the water cycle in order to appreciate the importance of wellhead protection planning.

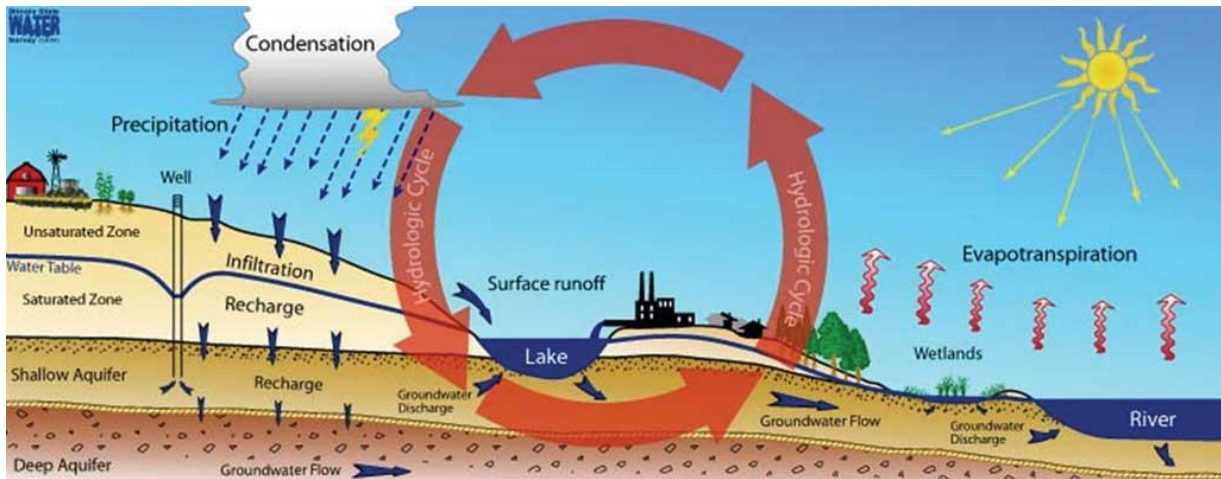


Figure 1. The Hydrological Cycle. Source: http://www.esri.com/news/arcuser/0408/graphics/groundwater_1_lg.jpg.

The continuous movement of water from solid to liquid throughout the natural environment is called the water cycle. Any type of pollutant introduced into the environment could potentially enter into the groundwater. Once a contaminant has entered the groundwater, it will remain there, but could take months, years or even decades to resurface again. Because of this prolonged process, it becomes difficult to determine the amount the contaminants present in the water supply. It is for these reasons that it is extremely important carefully monitor and protect a community's groundwater supply.

Groundwater is always subject to contamination; therefore it is clear to see why wellhead protection planning, as a proactive approach, is necessary for managing quality drinking water. Most communities engage in wellhead protection programs at the local level in order to promote healthy living and environmental stability. Protecting wellheads helps to ensure adequate sanitation, quality drinking water, and a reduction in costly contamination clean-up efforts. Wellhead protection involves the management of land surrounding areas containing both private and public wells in order to control and prevent pollution.

Most communities engage in wellhead protection programs at the local level in order to promote healthy living and environmental stability. Protecting wellheads helps to ensure adequate sanitation, quality drinking water, and a reduction in costly contamination clean-up efforts. Wellhead protection involves the management of land surrounding areas containing both private and public wells in order to control and prevent pollution.

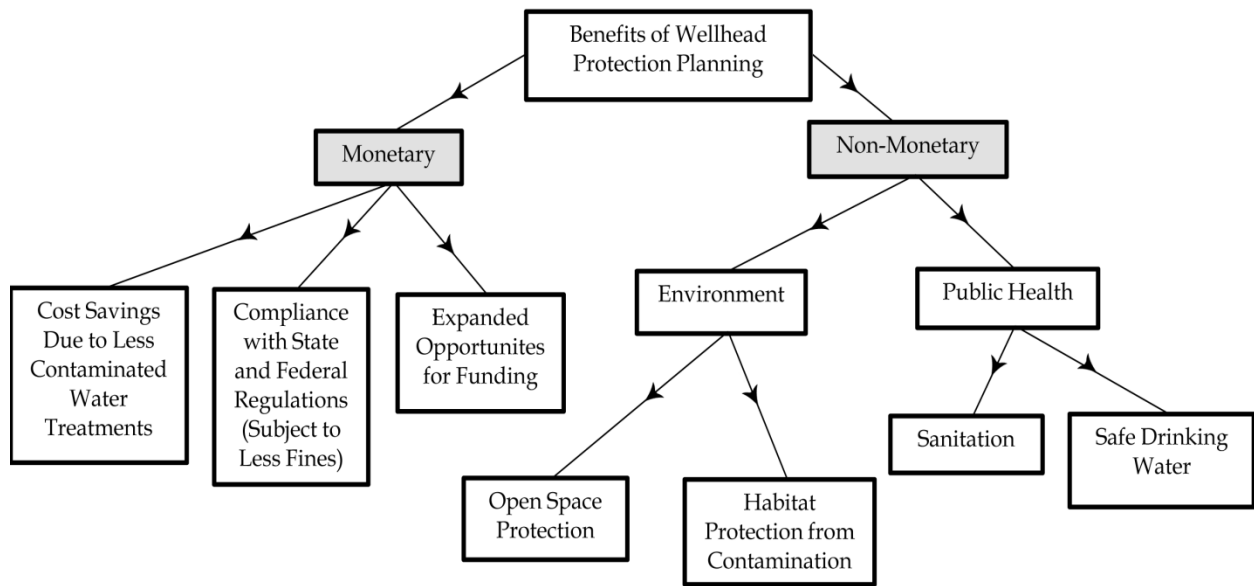


Figure 2. Benefits of WHPP. *Source:* Wellhead Protection Ordinance Evaluation Practicum Group 2011.

In the Tri-County area, wellhead protection is administered under federal, state, regional, and local governing bodies. Wellhead protection efforts typically involve these seven steps according to the Michigan Wellhead Protection Program guidelines: (“Teaming Up for Quality Drinking Water: The Michigan Wellhead Protection Program Guide”. *Michigan Department of Environmental Quality Drinking Water & Environmental Health Section.*)

1. Roles and duties for program development
2. Delineation of the wellhead protection area
3. Identification of potential and known contaminant sources
4. Management strategies
5. Contingency plans for the wellhead protection area
6. Development and implementation of a wellhead protection program for a new well or well field
7. Public participation

Federal and State Regulations

There are a variety of federal and state regulations that assist with the enforcement of protecting and managing groundwater. These regulations set standards on managing practices for local and regional governments. These uniform standards are necessary at the state and federal levels since groundwater is in continuous motion and contamination will likely affect a wide range of surrounding communities.

There are a number of regulations that affect groundwater protection and quality; however there are some more specific ones pertinent to wellhead protection planning. The Clean Water Act (CWA) of 1972 is the primary federal law governing water pollution and was the first to set quality standards for all bodies of surface water. While it does not specifically address groundwater, it does set limits on the amount of toxic waste that can be discharged into rivers, lakes and streams. By the interconnectedness of water systems, groundwater resources benefit from this regulation because surface water seeps through the soil to feed the aquifer. Through the CWA's Title VI, federal funds are allocated to states to capitalize on their revolving funds, which are used to provide financial loans or grants to local governments. This assistance is used for wastewater treatment, nonpoint source pollution control and estuary protection.

1974's Safe Drinking Water Act (SDWA) was implemented to ensure public access to quality drinking water and applies to every public water system in the United States. It requires the Environmental Protection Agency (EPA) to set standards for drinking water quality and provide oversight for states, localities and water suppliers, ensuring that standards are met. The Michigan Safe Drinking Water Act of 1976 granted the Michigan Department of Environmental Quality (MDEQ) regulatory authority for the public drinking water program within the state and drinking water well drilling. While the federal SDWA does not regulate private wells, it does regulate liquid waste contamination into the ground as well as monitoring and reporting requirements for drinking water. Over time, it has been updated to monitor for specific substance concentrations, provide the EPA with more enforcement powers, and in 1986, amendments to the SDWA established the concept of Wellhead Protection Programs (WHPPs) to serve as a pollution prevention and management initiative. The power to regulate Wellhead Protection Programs is delegated to state governments, and Michigan's is managed through the MDEQ. The MDEQ has an expressed mission to, "...assist local communities utilizing groundwater for their municipal drinking water supply systems in protecting their water source. A WHPP minimizes the potential for contamination by identifying and protecting the area that contributes water to municipal water supply wells and avoids costly groundwater clean-ups." WHPPs are voluntary, and implementation powers are left to the local or regional governing body.

Nationally, the Resource Conservation and Recovery Act (RCRA) of 1976 and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), provide further regulations regarding the management of hazardous waste, and include provisions that protect groundwater. The RCRA regulates the generation, storage, transport, treatment and storage of hazardous wastes and gives the EPA power to protect all groundwater sources from hazardous waste. The CERCLA, more commonly referred to as Superfund, cleans up existing hazardous waste sites that pose a threat to surface water, groundwater, or other sources.

As of August 31st, 2003, a Pollution Incident Prevention Plan (PIPP) was updated pursuant to Part 31 of the Natural Resources and Environmental Protection Act of 1994. The PIPP applies to any owner or operator of any on-land facility that receives uses, processes, manufactures, stores or ships polluting materials in excess of the applicable threshold management quantity

(TMQ). These requirements should prevent ground water and surface water from contamination from polluting materials. This 2005 version requires facilities to manage any polluting material, submit PIPPs and report spills of polluting material. However, there are some specific exemptions for many different types of facilities that are subject to other similar state or federal regulations or are otherwise not felt to represent significant environmental threats. TMQs, under the new ruling, are significantly larger than the previous threshold. Also, they distinguish between indoor and outdoor management of polluting materials and create an incentive to encourage indoor storage and handling of polluting materials. The final portion of the plan ruled that any on-land facility that has any outdoor storage areas, used to store liquid polluting materials in excess of the TMQ, shall provide secondary containment structures for those outdoor storage areas.

While these are not a comprehensive collection of federal groundwater laws, they provide the most direct regulation and are principal governing documents for water quality standards. More information for these regulations is available through the MDEQ.

Regional and Local Regulations

Local communities have authority for protecting groundwater resources through zoning and site plan review processes. There are also other regulations set in place within regions and localities which provide oversight for managing groundwater and wellhead protection areas. The enforceability associated with these regulations usually result in fines or a lack of funding if violations occur.

Eaton, Clinton, and Ingham Counties use an environmental permits checklist as part of the site plan review process for development. Therefore, local governments gain regulatory control by requiring a developer to fill out this checklist. This checklist provides a basis for developers to use for management of their project. This checklist provides specific stipulations about current regulations that will affect the development process. Many of the questions relate to groundwater and contamination by attempting to protect this natural resource. Moreover, there are specific questions pertaining to the construction of new wells and the acknowledgement of abandoned ones. It is important for developers to take into account the effects of new or redevelopment on the surrounding environment and specifically on the water supply. The permit checklists are attached for further reference (Appendix VII).

Michigan's Fire Fighter Right to Know Act (FFRTK) provides the local fire chief the right to request and receive a list of chemicals and MSDSs used at a specified location. Under the law, if the fire chief requests it, the following information must be provided within ten working days of the query:

- A listing of all hazardous chemicals at the location
- MSDSs for all hazardous chemicals at the location
- Information pertaining to the quantity and location of the chemicals

In addition, an employer must provide the fire chief with a written update "when there is a significant change relating to fire hazards and the quantity, location or presence of hazardous chemicals in the workplace." The ORCBS has this information on electronic database and will provide for this contingency when required.

The Ingham County Board of Commissioners adopted a Point of Sale (POS) regulation required for the inspection of residential on-site water and sewage disposal. A household is required to

complete an inspection for all private septic systems and wells located on the residential property before selling the property. This regulation helps account for private wells and requires proper plugging for individual properties not in compliance with current inspection and evaluation criteria. The Ingham County Health Department assists with inspections and evaluates reports. This is a fairly new regulation enacted in 2006.

The Barry-Eaton District Health Department adopted a Time of Sale or Transfer (TOST) that places requirements on a parcel containing an on-site sewage system and/or on-site water supply system. Until the following criteria is met, there will no sale or transfer. The first of which requires documentation of a transfer evaluation by a registered evaluator to the Health Department. During this transfer evaluation, the Health Department determines that the condition and operation of the system is not in a state of failure or that any necessary system maintenance or remediation has been completed or assured and approved. Once this is completed, the Health Department issues the final step and provides a transfer authorization for sale or transfer of the parcel. This final step completes the requirements for the Barry-Eaton TOST.

Meanwhile, the Mid Michigan District Health Department, serving Clinton County, has not officially adopted a POS or TOST ordinance thus far. However, since none of our six case study communities are located within or fall under the jurisdiction of Clinton County, Clinton County's regulations relating to groundwater and wellhead protection were not fully examined.

CURRENT WELLHEAD AND GROUNDWATER TRENDS

Statewide

Groundwater is a very valuable resource for all communities. Without quality water, a municipality could incur catastrophic problems including: agricultural failures, water-borne infections, disease and even death. Groundwater in Michigan is used for industry, irrigation, as well as public water supply. It is a very important natural resource to Michigan as an entirety due to overwhelming public and private reliance.

Pertinent state statistics on groundwater:

(“Ground Water Statistics”, *Michigan Department of Environmental Quality*)

- About half of Michigan’s population depends on groundwater for drinking water;
- Michigan has more households (1.25 million) served by private wells than any other state in the nation;
- Michigan’s private household wells withdraw 194 million gallons of groundwater each day, while total groundwater use in Michigan equals about 700 million gallons each day.

The Pennsylvanian Saginaw Aquifer is the main water supplier for most communities in the Tri-County area. It is considered a confined bedrock aquifer with a sandstone layer reaching depths from 100 to 400 feet depending on the specific topography located above.

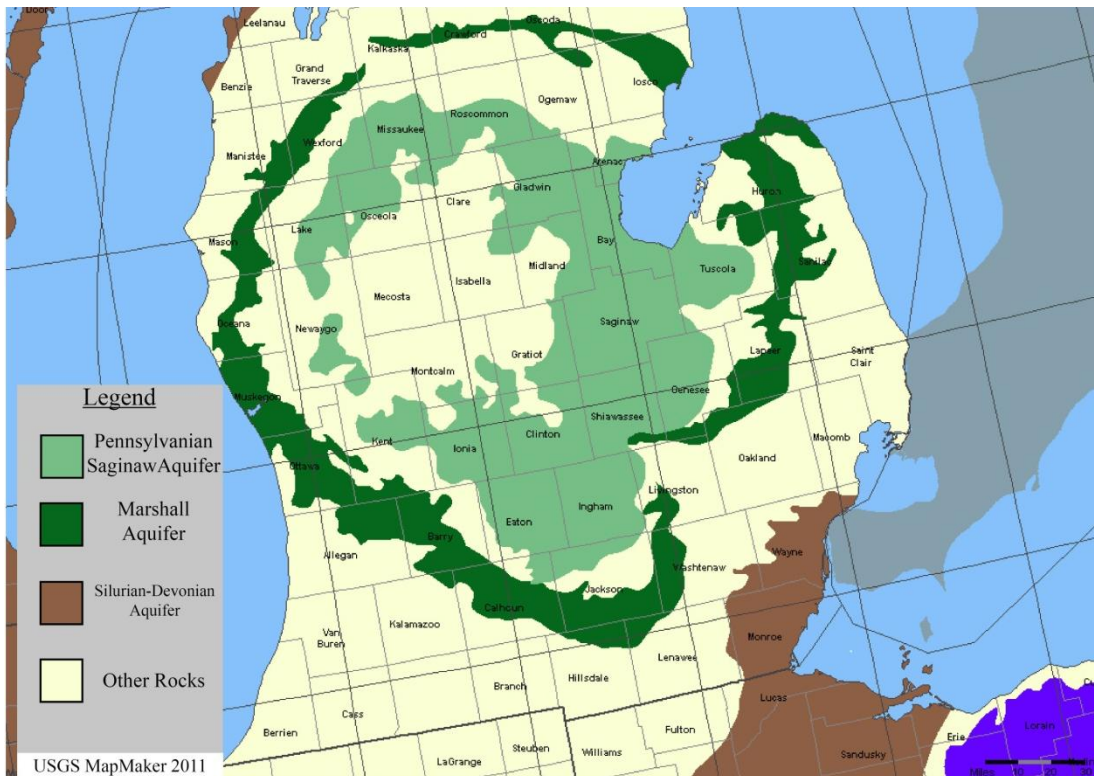


Figure 3. Saginaw Aquifer. *Source:* USGS MapMaker 2011

Most of Mid-Michigan and the Tri-County area depend on groundwater resources from the Pennsylvanian Saginaw Aquifer which is delineated in light green in Figure 3. Most of the public and private wells located within these counties probably depend on this aquifer for water. This aquifer also serves other communities, which is why regional groundwater protection efforts are necessary.

Tri-County

All of the six Tri-County communities receive municipal water from the Lansing Board of Water and Light (LBWL), while parts of Delta Township, the City of Lansing, and the west side of Lansing Township also receive water from West Side Water. West Side Water however is in contract with the LBWL, as the LBWL is accountable for all filtration services. West Side Water is responsible for the operation and maintenance of all storage and pumping facilities in several areas of Lansing Township.

There are a number of wells that have been drilled, dug, and driven over the years as this region expanded. The table below indicates the numbers of wells for each community, that are accounted for and managed, separated by type of well. It is important to keep in mind that there are still a number of abandoned wells that have not been accounted for or managed in this area.

Number of Wells in Tri-County Region							
	Public*	Private*	Irrigation*	Test*	Industrial*	Monitoring*	Plugged*
Delhi Charter Township	30	1188	16	1	2	37	50
Delta Charter Township	23	398	7	0	3	6	40
City of East Lansing	18	45	8	1	0	2	14
City of Lansing	135	73	10	3	2	11	30
Lansing Charter Township	11	27	3	0	0	2	11
Meridian Charter Township	49	1134	23	25	0	23	34

Figure 4. Number of Wells in Tri-County Region. *Source:* Tri-County InfoGeographics Wellhead Protection Viewer 2011 & Wellogic, Michigan Department of Environmental Quality 2011. <https://secure1.state.mi.us/wellogic/Login.aspx>

*See Page 17 of this report for definitions of well types.

Abandoned Wells

Abandoned wells pose a significant threat to groundwater; a well left unprotected is a direct conduit for pollution to the aquifer. While plumes of pollution within contaminated soils may take weeks, months, or even years to creep into the aquifer, a contamination event involving an abandoned well is immediate, irreversible, and poses a threat to the entire community's and even region's water supply.

Typically, abandoned wells are found in rural areas without municipal drinking water infrastructure, where private household wells are common. However, many still exist in urban places as a remnant of times before the growth of municipal water services. Whether urban or rural, abandoned wells are a danger and should be plugged to prevent the contamination of groundwater used by active surrounding wells.

Plugging of abandoned wells in the Tri-County area is required at the time of sale of the property through district health department ordinances (Barry-Eaton District Health Department's Time of Sale Transfer and Ingham County Health Department's Point of Sale ordinance; see Appendix VIII). All communities involved in this study require abandoned wells to be plugged when there is a change of use, though not all provide financial assistance for the costs of plugging. Of the six Tri-County communities, only Delta Township provides financial assistance for plugging wells. The average total cost of plugging a well in this region ranges from \$800-\$2,000; Delta Township provides half the cost of plugging, up to \$600.

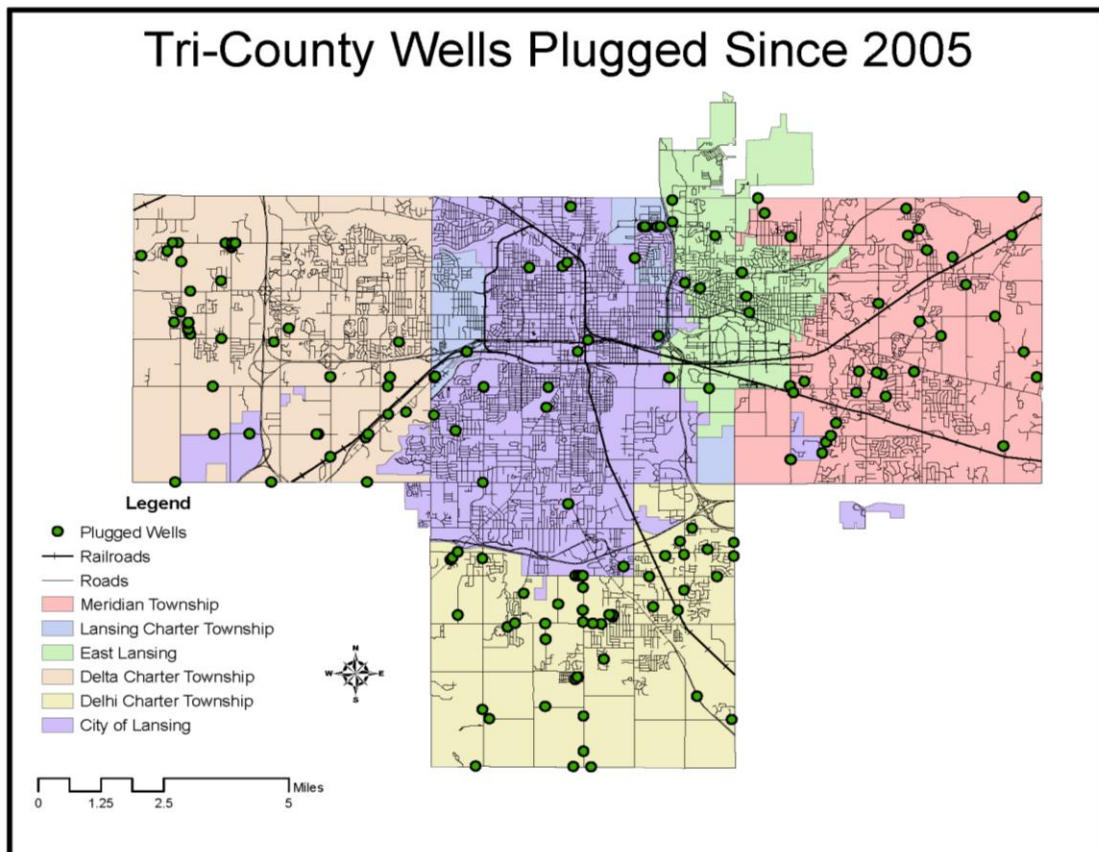


Figure 5. Source: Wellogic, Michigan Department of Environmental Quality 2011 (<https://secure1.state.mi.us/wellogic/Login.aspx>)

Well Plugging Assessment:

Extrapolating information from the “Tri-County Wells Plugged Since 2005” map, it is apparent that Delhi and Delta Township have the highest frequency of plugged wells, followed closely by Meridian Township. This pattern of well plugging is perhaps due to two factors; the presence of well plugging assistance and the concentration of abandoned wells. More urbanized communities, like Lansing Township and the Cities of Lansing and East Lansing, have operated on municipal water for decades and their roots as rural communities are more distant.

Abandoned wells will continue to pose a safety, environmental, and health threat to citizens, ecosystems, and groundwater resources if left unidentified. Without any available records, identifying these wells proves difficult. So, it is important to encourage property owners to look for evidence of aged abandoned wells. The MDEQ suggests land assessment as the best way to locate threatening wells (“Plugged Abandoned Water Wells, *MDEQ*). Furthermore, they suggest “looking for pipes sticking above ground, pipes sticking through wall or floor in the basement, electrical switch boxes out in the yard, cement pits in or under sheds, windmills, old crock, brick, or stone structures, and old hand pumps”. Similarly, they suggest scanning for buried wells by relying on metal detectors for finding buried steel well casings as well as relying on information from neighbors and the elderly. While these techniques are not enforceable, they should be encouraged by local and regional governing bodies. These voluntary investigations will only support and increase life quality.

INDIVIDUAL COMMUNITY REPORTS

Overview

Wellhead and Groundwater Protection Audit Tool

Introduction

The Groundwater Protection Audit Tool has been developed to assess six specific communities (Charter Townships of Delhi, Delta, Lansing, and Meridian, and the Cities of Lansing and East Lansing) within the Tri-County area for their application of contemporary standards as they apply to groundwater and wellhead protection. The tool seeks to identify strengths, weaknesses, opportunities and threats related to groundwater resources in the community, and to provide a framework for individual community recommendations.

This Groundwater Protection Audit Tool has been adapted from various planning, zoning, and water quality-related audit tools including:

- Kurt Schindler's *Community Planning and Zoning Audit*
<http://web5.msue.msu.edu/lu/pamphlet/Baudit/PlnASystCPZApart8.pdf>
- Planning & Zoning Center at MSU's *Saginaw Bay Watershed Audit Tool*
Not yet published
- Maryland DNR's *Tool 14: Watershed Protection Program Audit*
<http://www.dnr.state.md.us/watersheds/pubs/planninguserguide/tools/Tool14EightToolsAudit.pdf>

Organization and Content

The content of this tool is organized to fit within a survey-style question-and-answer form; the complexity of answers varies by question and quotes and citations to community documents should be provided when applicable.

These communities will be evaluated based on three categories:

- The identification of elements (particularly goals, objectives, and strategies) in the master plan that relate to groundwater and wellhead protection
- An assessment of rules and regulations that relate to groundwater in the zoning ordinance or other pertinent ordinances
- An interview of a wellhead protection specialist (typically a planner or engineer) in the community focusing in the categories of **procedures and enforcement, education and outreach, and information sharing and data management**

Based on the answers provided from the question-and-answer portion of the audit; an analysis of strengths, weaknesses, opportunities, and threats (SWOT) has been populated for the

community. This SWOT analysis aids in the identification of barriers and gauge the community's potential room for improvement.

A comprehensive final analysis is provided for the community which will give a critique for each category and address specific questions from the audit. This final analysis will eventually serve as the framework for personalized individual community recommendations.

Geographic Information Systems Data

First, a map of the Tri-County region will delineate the six communities and show the area's outlined WHPAs (pg. 17). For each community's report, there are 2 maps to provide a visual representation of data pertinent to wellhead protection. The first delineates the various wellheads across the communities. These are useful in determining area of WHP's versus non-WHP's as well as giving a good reference for the protection plans. It includes multiple types of wells and their locations.

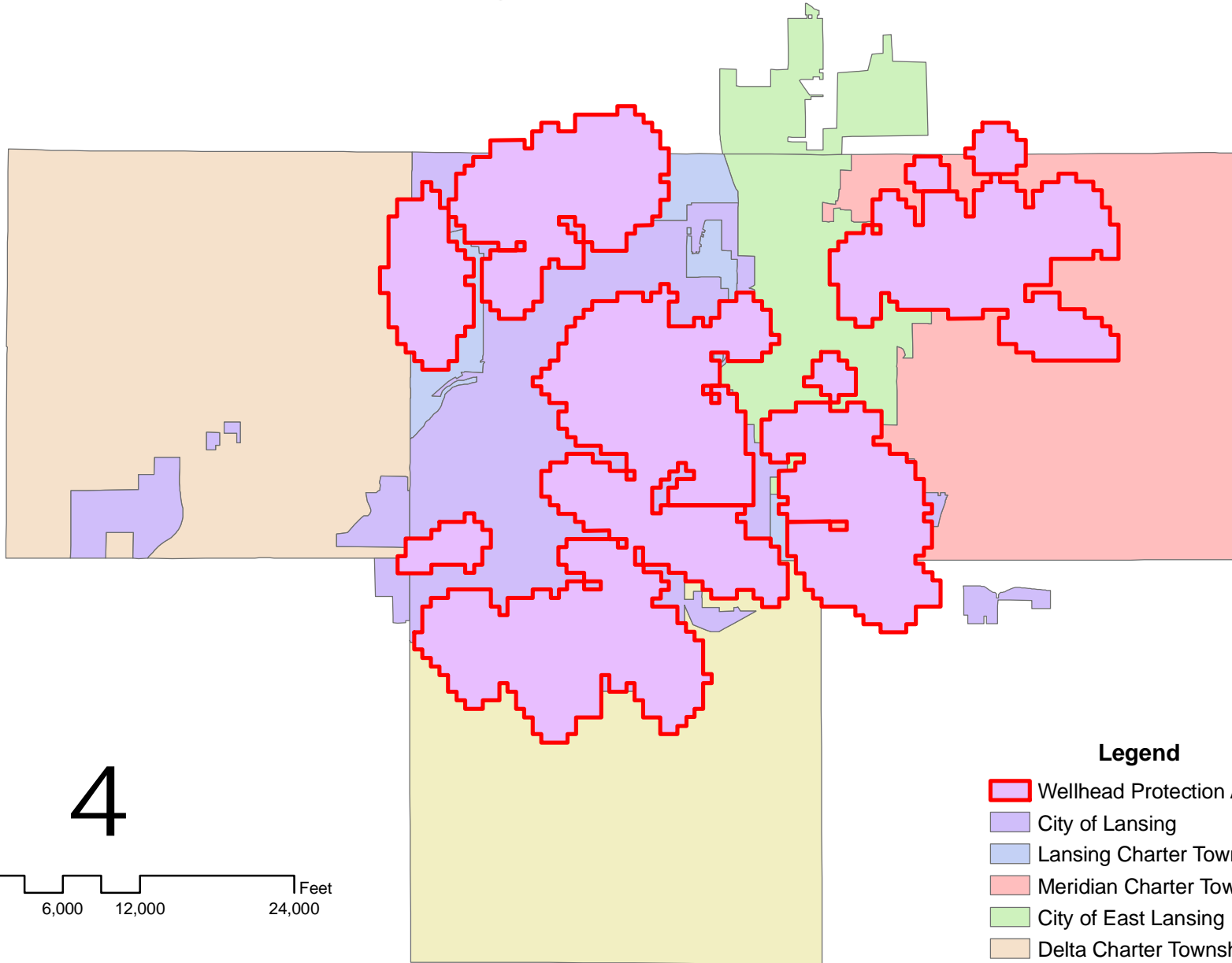
These types (defined by the MDEQ) are:

- Irrigation wells which are used to provide water for livestock, plants and other agricultural needs. Examples of these can include agricultural and golf course irrigation/
- Industrial Wells which provide for the water needs at industrial sites. Fire protection and other high use industrial processes are common necessities
- Test wells are obtained for a number of reasons. Essentially, these wells identify water levels and quality, as well as, aquifer type, level, and other characteristics. This data is used for the purpose of designing and operating water wells.
- Public wells can be broken up into three different types
 - Type 1 – Community Public – These wells provide year round water supply to no less than 25 residents or 15 living units. They are often seen supplying apartment complexes, and mobile home parks.
 - Type 2 – Non-transient Non-community Public Water Supply- Type 2 non-transient wells serve at least 25 of the same residents for at least 6 months a year. These commonly include schools and places of employment.
 - Type 2 – Transient Non-community Public Water Supply- Type 2 transient wells serve at least 25 people or connections for at minimum 60 days year. Hotels, restaurants and camp grounds utilize these wells frequently.
- Type 3- Public Water Supply- Public water wells serve the majority of the population. Any well not type 1 or 2; serves less than 25 people or 15 connections, or operates for less than 60 days per year can classify as public wells. Predominant uses for public wells serve apartment complexes, condos and town houses.

- Monitoring wells are used to view the wells hydraulic head or sample the groundwater for chemical compositions. This helps to assimilate contamination and is often used in conjunction with wellhead protection areas.
- Plugged wells are often no longer in service or abandoned. Plugging these wells helps to prevent contamination and accurately assess water usage

The third map delineates the plugged wells in each community. The plugged well map gives a view of the work the city has been able to do at plugging wells. The data used is from the DEQ and was geocoded into a GIS shapefile using the Tri-County address locator. This data is the most complete source available at this time and shows the plugging of wells since 2005.

Tri-County Target Community's WHPAs



4

0 6,000 12,000 24,000 Feet

Legend

- Wellhead Protection Areas
- City of Lansing
- Lansing Charter Township
- Meridian Charter Township
- City of East Lansing
- Delta Charter Township
- Delhi Charter Township

Wellhead and Groundwater Protection Audit Assessment

<u>Master Plan</u>		Delhi Township	Delta Township	City of East Lansing	City of Lansing	Lansing Township	Meridian Township
<i>Year last updated</i>	2007	2004	2006	1958	2009	2005	
1.) Are wellhead protection areas (WHPA) included in the plan?	X				X		
2.) Are WHPAs defined?	X*				X*	X*	
3.) Does the community utilize overlay zones for wellhead protection areas?†							
4.) Is there reference to designated Brownfield sites located within WHPAs?			X*		X		
5.) In the goals and objectives section of the master plan, is the protection of groundwater an issue of importance for the community?	X	X			X	X	
6.) If yes, is the community's strategy for protection noted?	X	X			X	X	
7.) Does the plan evaluate and take into account impacts of future land use changes on groundwater?	X	X		X*		X*	
8.) Does the plan acknowledge the need for a regional effort for groundwater protection?	X	X			X	X	
9.) Are specific sites with existing or perceived sources of contamination identified in the plan?	X		X		X	X	

X-Yes, X*-implied, but not explicitly stated; † question not factored into findings - irrelevant beyond identification

Zoning Ordinance						
	Delhi Township	Delta Township	City of East Lansing	City of Lansing	Lansing Township	Meridian Township
10.) Are WHPAs free of any districts zoned for medium or heavy industrial uses?†	X		X			X
11.) Are abandoned water wells, abandoned monitoring wells and cisterns plugged in accordance with regulations and procedures of the Michigan Department of Environmental Quality as well as the county health department?†	X	X*	X	X	X*	X
12.) Do any of the community's ordinances contain regulations on the withdrawal of groundwater (volumes or rates) from industrial/commercial wells?						X*
13.) Does the zoning ordinance include the definitions of materials deemed to be 'hazardous substances'?	X	X	X	X	X	X
14.) Are above ground storage tanks certified, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality?	X	X*	X	X	X	X
15.) Are underground storage tanks registered, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality?	X	X*	X	X	X	X
16.) Are local regulations present that require bulk storage facilities which house pesticides and fertilizers to be in compliance with Michigan Department of Agriculture requirements?	X	X*	X	X	X	X
17.) Does the zoning ordinance set limits on the volume of fuels able to be stored on-site for land uses other than designated fuel storage areas?						
18.) Are there any provisions in the zoning ordinance for the demolition of buildings that include the management of wells as a standard?			X*	X	X	
19.) Are provisions present that explicitly state that no discharge to surface water or groundwater, including direct and indirect discharges of waste, waste effluent, wastewater, pollutants, or cooling water, shall be allowed without approval from appropriate state, county and local agencies?			X	X	X	X
20.) Does the zoning ordinance contain provisions for the protection of areas with a high potential for groundwater recharge?†	X	X	X		X	X

X-Yes, X*-implied, but not explicitly stated; † question not factored into findings - irrelevant beyond identification

Zoning Ordinance: Site Plan Review						
	Delhi Township	Delta Township	City of East Lansing	City of Lansing	Lansing Township	Meridian Township
21.) Please indicate which of the following conditions/requirements are present for approval of site plans:						
Existing topographic elevations at two (2) foot contour intervals. Indicate direction of drainage flow.	X	X	X	X	X	X
The location and elevations of existing water courses and water bodies, including county drains and manmade surface drainageways, floodplains, and wetlands.	X	X	X	X	X	X
Location for on-site wastewater treatment and disposal systems.	X*	X	X	X	X	X
Location for existing and proposed public and private drinking water wells, monitoring wells, irrigation wells, test wells or wells used for industrial processes.	X	X	X	X	X	X
Description and location for any existing or proposed above ground and below ground storage facilities.	X	X	X	X	X	X
<i>If floor drains are permitted:</i> The location and status of any floor drains in existing or proposed structures on the site. The point of discharge for all drains and pipes shall be specified on the site plan.	X	X*	X	X*	X	X
<i>If floor drains are permitted:</i> Is it a requirement that they be connected to subsurface wastewater disposal systems?	X*			X*		X
Inventory of hazardous substances to be stored, used or generated on-site, presented in a format acceptable to the local fire marshal (include Chemical Abstracts Service (CAS) numbers).	X	X	X	X	X	X
Descriptions of type of operations proposed for the project and drawings showing size, location, and description of any proposed interior or exterior areas of structures for storing, using, loading or unloading of hazardous substances, hazardous wastes, and/or polluting materials.	X	X	X	X	X	X
Completion of the Environmental Permits Checklist on the form provided by the Zoning Administrator.	X	X	X	X	X	X
Does the zoning ordinance contain specific provisions for the on-site handling, storage, use, and manufacture of chemicals?		X	X		X	X
If yes to the previous question, does the zoning ordinance explicitly state that the storage of fuels, chemicals, and other hazardous substances will be stored in a location with an impervious floor that lacks floor drains?		X				

X-Yes, X*-implied, but not explicitly stated; † question not factored into findings - irrelevant beyond identification

	Delhi Township	Delta Township	City of East Lansing	City of Lansing	Lansing Township	Meridian Township
Interview Questions*						
22.) Does the community require onsite inspections of new land uses in WHPAs?	X	X	X	X*	X	X*
23.) Is a Phase I Environmental Assessment required before starting development in WHPA?			X*	X*		X*
24.) Have no new variances been issued in the past three years that affect groundwater regulations?	X	X	X	X	X	X
25.) Does the community require potentially contaminating land uses to submit contingency plans for emergency response?	X	X	X	X	X	X
26.) If yes, do these plans ensure protection from discharges and spills to groundwater?	X	X	X	X	X	X
27.) Does the community provide incentives in reporting and plugging private abandoned wells?		X				
28.) Does the community have signs to build awareness about WHPAs?					X	
29.) When a community delineates a new WHPA, is the information shared with other communities within the 10-year time of travel?	X*		X	X	X	X
30.) Have any new public wells been drilled in the community since 2005? †						
31.) Are local groundwater regulations reviewed by a regional authority prior to implementation?	X	X	X	X	X*	X
32.) Does your community maintain basic groundwater-based GIS data layers?	X			X	X	X

***Some of the interview questions from the wellhead and groundwater protection audit tool are not included on this matrix due to complexity of answers.
(Question numbering may not coincide with audit tool numbering)**

X-Yes, X*-implied, but not explicitly stated; † question not factored into findings - irrelevant beyond identification

REGIONAL FINDINGS

All six communities have met the following standards that help to strengthen groundwater and wellhead protection

The Zoning Ordinance for each community:

- Regulates that abandoned water wells, abandoned monitoring wells and cisterns be plugged in accordance with regulations and procedures of the Michigan Department of Environmental Quality as well as the county health department
- Includes the definitions of materials deemed to be 'hazardous substances'
- States that above ground storage tanks be certified, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality
- States that underground storage tanks be registered, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality
- States that local regulations be present that require bulk storage facilities which house pesticides and fertilizers to be in compliance with Michigan Department of Agriculture requirements

The Site Plan Review's requirements for site approval include:

- Existing topographic elevations at two (2) foot contour intervals and indicate direction of drainage flow.
- The location and elevations of existing water courses and water bodies, including county drains and manmade surface drainageways, floodplains, and wetlands.
- Location for on-site wastewater treatment and disposal systems.
- Location for existing and proposed public and private drinking water wells, monitoring wells, irrigation wells, test wells or wells used for industrial processes.
- Description and location for any existing or proposed above ground and below ground storage facilities.
- The location and status of any floor drains in existing or proposed structures on the site. The point of discharge for all drains and pipes shall be specified on the site plan. (If floor drains are permitted)
- An inventory of hazardous substances to be stored, used or generated on-site, presented in a format acceptable to the local fire marshal (include Chemical Abstracts Service (CAS) numbers).
- Descriptions of the types of operations proposed for the project and drawings showing size, location, and description of any proposed interior or exterior areas of structures for storing, using, loading or unloading of hazardous substances, hazardous wastes, and/or polluting materials.
- Completion of the Environmental Permits Checklist on the form provided by the Zoning Administrator.

From interviews with the professional planners, the 6 communities:

- Require potentially contaminating land uses to submit contingency plans for emergency response

- Ensure protection from discharges and spills to groundwater through contingency their plans
- Share information with other communities within the 10-year time of travel when a community delineates a new wellhead protection areas
- Ensure that new regulations concerning wellhead and groundwater issues are thoroughly reviewed by the regional planning authority.

Findings and Recommendations for
DELHI CHARTER TOWNSHIP

Master Plan

Findings for Delhi Township indicate **6 of 8** outcomes have been met. For further improvement, the community can:

- Define WHPAs using local, state, or federal definitions
- Cite the location of existing and perceived sources of contamination as well as designated Brownfield sites located within the WHPAs

Zoning Ordinance

Findings for Delhi Township indicate **5 of 8** outcomes have been met. For further improvement, the community can:

- Amend zoning ordinance to set limits for volumes of on-site storage of fuel and other potential contaminants
- Create ordinance provisions for the demolition of buildings that ensure the safeguarding of wells
- Create zoning provisions that explicitly state that “no discharge to surface water or groundwater, including direct and indirect discharges of waste, waste effluent, wastewater, pollutants, or cooling water, shall be allowed without approval from appropriate state, county and local agencies”

Site Plan Review

Findings for Delhi Township indicate **8 of 12** outcomes have been met. For further improvement, the community can:

- If floor drains are permitted, require that they be connected to subsurface wastewater disposal systems
- Include specific provisions for the on-site handling, storage, use, and manufacture of chemicals that explicitly states that “the storage of fuels, chemicals, and other hazardous substances will be stored in a location with an impervious floor that lacks floor drains”

General Recommendations

Findings from an interview with Tracy Miller indicate **7 of 11** satisfactory responses. For further improvement, the community can:

- Set standards for when a Phase I Environmental Site Assessments are required; make these a requirement for any new development in WHPAs
- Develop assistance programs (financial and/or technical) for locating and plugging abandoned wells
- Develop an awareness program for WHPAs that includes signage
- Gather and maintain basic GIS data on wells and WHPAs
- Update Contingency Plans

Emergency response is imperative for the prevention of serious contamination issues. Without adequate plans to deal with these situations, detrimental effects can come to ground water and wellhead protection areas. Also, clean up can become increasingly more expensive as time goes on. Fire response must have

knowledge of locations with hazardous material in order to handle the emergency correctly. Improper fire control can cause contamination to runoff into groundwater and potentially pollute drinking water. Furthermore, outside externalities, such as a railway spill, must be cleaned promptly and efficiently to ensure the wellbeing of groundwater and wellhead protection areas.

- **Maintain Current Data on Groundwater**

Current and regularly updated groundwater information is important in the maintenance of the community's water quality and usage. Without regular groundwater monitoring, issues can arise that would have a much greater impact than if acknowledged early on. Low water levels require a particular response, and without proactive knowledge of this, a well could dry up unnoticed. Furthermore, contamination that is found early will greatly decrease the impact it has on surrounding areas. It is important to maintain these practices of regular upkeep of groundwater data to be knowledgeable of arising issues.

- **Encourage Best Management Practices**

This can be done through media campaigns, public awareness and education programs, as well as by word of mouth. Best management practices are important for mitigation and prevention of potentially hazardous and costly environmental risks. In this case drinking water is at risk of contamination. Local officials can encourage best management practices to assist with preventative wellhead protection planning.

Wellhead and Groundwater Protection Audit Tool: Delhi Charter Township

Master Plan

This section is to be completed by relying on the community's master plan document (Delhi Charter Township Master Plan 2007) as well as any supplementary adopted plans. This section is broken into two parts with specific questions for: wellhead protection and groundwater protection. This is done in order to make direct wellhead protection planning clear. The groundwater specific part includes additional questions related to protecting groundwater resources which have an effect on wellheads. These two categories complement each other and help create a more comprehensive overview. Each question is to be answered with citations as to where the information is found in the legal documents to ensure quick access for reference.

Wellhead Protection

Question	Response
1) Are the wellhead protection areas (WHPAs) included in the plan?	Yes, pg. 62: "Delhi Township is one of twelve dues paying members of the Groundwater Management Board (GMB.) which was created in 1983 as an ongoing forum for groundwater protection issues, and has helped GMB communities to delineate wellhead protection areas for their municipal water wells."
2) Are WHPAs defined?	Not explicitly, (pg.62). "Some Wellhead Protection Areas cross municipal lines into the City of Lansing and Alaieton Township...".
3) Does the community utilize overlay zones for WHPAs?	No
4) Is there reference to designated Brownfield sites located within WHPAs?	No

Groundwater Protection

Question	Response
5) In the goals and objectives section of the master plan, is the protection of groundwater an issue of importance for the community?	Yes, pg. 67: "Goal 2, Protect the groundwater, surface waters, and shorelines".
6) <i>Follow-up:</i> If yes, is the community's strategy for protection noted?	Yes, pg. 62: "To pursue groundwater protection at the Township level, Delhi can pursue several different planning initiatives. Developed site plan amendments within the zoning ordinance regarding wellheads ensure the protection of these areas from development. A workbook has been developed by the GMB. with a "fill in the blank" approach to help with the development of management plans. Classes are offered periodically and staff from the GMB is available to provide assistance."
7) Does the plan evaluate and take into account impacts of future land use changes on groundwater?	Yes, pg. 62: "Delhi Township can work cooperatively with the Lansing Board of Water and Light so that areas already selected for future municipal wells are taken into consideration when making land use decisions".
8) Does the plan acknowledge the need for a regional effort for groundwater protection?	Yes, pg.62: "To pursue groundwater protection at the Township level, Delhi can pursue several different planning initiatives. Developed site plan amendments within the zoning ordinance regarding wellheads ensure the protection of these areas from development. A workbook has been developed by the G.M.B. with a "fill in the blank" approach to help with the development of management plans. Classes are offered periodically and staff from the GMB is available to provide assistance."pg. 63 "Remembering that groundwater contamination does not stop at municipal lines, it is clear that great care must be taken through sound planning practices to assure that Township residents continue to enjoy a plentiful, quality water supply".

9) Are specific sites with existing or perceived sources of contamination identified in the plan?	Yes, pg. 63” Ingham County Health Department keeps track of sites where contamination is known or likely to exist in order to prevent new wells from being located on or near the site. Although some listings may also be considered 201 or LUST site listings, the Health Department lists fifteen sites within Delhi Township and sixty-four throughout the County”; pg. 67: “There are areas of pollution within Delhi Township on record at both the State and County levels. The Environmental Response Division of the Department of Environmental Quality (DEQ) regulates sites defined as "contaminated" by State Statute (Part 201 of P.A. 451 of 1994). Known as "201 Sites", the State currently reports four within Delhi Township including the Gunn Road Landfill. The Underground Storage Tank Division of the DEQ is responsible for keeping track of Leaking Underground Storage Tanks (LUST sites) which are not included as 201 sites.”
---	---

Zoning Ordinance

This section is to be completed by relying on the community’s zoning ordinance and site plan review documents (Code of Ordinances: Charter Township of Delhi, Michigan. Codified through Ordinance No.118, adopted May 18, 2010. (Supplement No. 14)). This section is broken into two parts: general zoning ordinance questions and site plan review assessment. The site plan review is usually located within the zoning ordinance, which is why they are organized accordingly. The general zoning ordinance section is further broken down into questions pertaining to wellhead protection and groundwater protection separately. This is again done in order to make a distinction between wellhead protection planning and the topic of overall groundwater protection planning. The site plan review assessment contains questions specific to new development procedures or land use changes. Each question is to be answered with citations as to where the information is found in the legal documents to ensure quick access for reference.

Wellhead Protection

<u>Question</u>	<u>Response</u>
10) Does the WHPA encompass any districts zoned for medium or heavy industrial uses?	Yes, based on a comparison of zoning maps and WHPA maps, it is apparent that the Industrial Warehouse District which allows for the storage of fuels, chemicals, and hazardous waste resides within a WHPA.
11) Are abandoned water wells, abandoned monitoring wells and cisterns plugged in accordance with regulations and procedures of the Michigan Department of Environmental Quality as well as the county health department?	Yes, section 3.3.6: “Abandoned water wells (wells that are no longer in use or are in disrepair), abandoned monitoring wells, and cisterns shall be plugged in accordance with regulations and procedures of the Michigan Department of Environmental Quality and the Ingham County Health Department.”
12) Do any of the community’s ordinances contain regulations on the withdrawal of groundwater (volumes or rates) from industrial/commercial wells?	No
13) Does the zoning ordinance include the definitions of materials deemed to be ‘hazardous substances’?	Yes, section 6.75: “Hazardous substance/waste, as defined by section 101(14) of the United States Comprehensive Environmental Response Compensation and Liability Act (CERCLA) means a substance designated pursuant to section 311 (B)(2))(A) of the Federal Water Pollution Control Act; any element, compound, mixture, solution or substance designated pursuant to section 102 of CERCLA; any hazardous waste having characteristics identified under or listed pursuant to section 3001 of the Solid Waste Disposal Act (not including waste regulations suspended by act of Congress); any toxic pollutant listed under section 307(a) of the Federal Water Pollution Control Act; any hazardous air pollutant listed under section 102 of the Clean Air Act; and any hazardous chemical substance or mixture with respect to which the administrator has taken action pursuant to section 7 of the Toxic

	Substance Control Act.”
14) Are above ground storage tanks certified, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality? <i>(Source: Mark Wyckoff Recommendations for Tri-County Communities on WHP Regulations, 2000)</i>	Yes, section 3.3: “Above ground storage tanks shall be certified, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality.”
15) Are underground storage tanks registered, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality? <i>(Source: Mark Wyckoff, Recommendations for Tri-County Communities on WHP Regulations, 2000)</i>	Yes, section 3.3: “Underground storage tanks shall be registered, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality.”
16) Are local regulations present that require bulk storage facilities which house pesticides and fertilizers to be in compliance with Michigan Department of Agriculture requirements? <i>(Source: Mark Wyckoff, Recommendations for Tri-County Communities on WHP Regulations, 2000)</i>	Yes, section 3.3: “Built storage facilities for pesticides and fertilizers shall be in compliance with requirements of the Michigan Department of Agriculture.”
17) Does the zoning ordinance set limits on the volume of fuels able to be stored on-site for land uses other than designated fuel storage areas?	No
18) Are there any provisions in the zoning ordinance for the demolition of buildings that include the management of wells as a standard?	No

Groundwater Protection

<u>Question</u>	<u>Response</u>
19) Are provisions present that explicitly state that no discharge to surface water or groundwater, including direct and indirect discharges of waste, waste effluent, wastewater, pollutants, or cooling water, shall be allowed without approval from appropriate state, county and local agencies? <i>(Source: Mark Wyckoff, Recommendations for Tri-County Communities on WHP Regulations, 2000)</i>	No

20) Does the zoning ordinance contain provisions for the protection of areas with a high potential for groundwater recharge?	Yes, section 5.15.9: "It is the further intent of this district (Industrial Warehouse District) to only allow uses that are compatible with and not potentially injurious to those areas of the township that are groundwater recharge areas."

Site Plan Review Assessment

<u>Question</u>	<u>Response</u>
21) Please indicate which of the following conditions/requirements are present for approval of site plans:	
➤ Existing topographic elevations at two (2) foot contour intervals. Indicate direction of drainage flow.	Yes, section 3.3: "With (two-foot contour intervals) off-site elevations within approximately one hundred (100) feet of the property. Include finish floor elevations, drainage and typical cross sections. Drainage plan shall address natural drainage, storm sewer systems, subdrainage, and soil sedimentation and erosion control."
➤ The location and elevations of existing water courses and water bodies, including county drains and manmade surface drainageways, floodplains, and wetlands.	Yes, section 3.3: "The location and elevations of existing watercourses and waterbodies, including county drains and manmade surface drainage ways, floodplains and wetlands."
➤ Location for on-site wastewater treatment and disposal systems.	Yes, but not explicitly, section 3.3: "Location and outline of all existing development and natural features on the site and adjacent sites within two hundred (200) feet of the property line, such as buildings, drives, parking areas, wells, septic tanks, drain fields, utilities, poles, ditches, underground storage tanks, above ground storage areas, woods, streams, marshes, wetlands, fence rows, individual trees of six (6) inches or larger caliper when not located in a woods, 100-year flood hazard area depicted in plan view. Utilities plan - showing on-site utility locations, including sanitary sewer sanitary sewer service, waterlines, gas, electrical, telephone, cable television and other pertinent utility information".
➤ Location of existing and proposed public and private drinking water wells, monitoring wells, irrigation wells, test wells or wells used for industrial processes.	Yes, section 3.3: "Location of existing and proposed public water mains, public and private drinking water wells, monitoring wells, irrigation wells, test wells or wells used for industrial processes."
➤ Description and location for any existing or proposed above ground and below ground storage facilities.	Yes, section 3.3: "Description and location for any existing or proposed above ground and below ground storage facilities."
➤ <i>If floor drains are permitted:</i> The location and status of any floor drains in existing or proposed structures on the site. The point of discharge for all drains and pipes shall be specified on the site plan.	Yes, section 3.3: "The location and status of any floor drains in existing or proposed structures on the site. The point of discharge for all drain and pipes shall be specified on the site plan."
➤ <i>If floor drains are permitted:</i> Is it a requirement that they be connected to subsurface wastewater disposal systems?	Yes, not explicitly stated, section 3.3: "General purpose floor drains shall be connected to a public sewer system or an on-site holding tank (not a septic system) in accordance with state, county and municipal requirements, unless a groundwater discharge permit has been obtained from the Michigan Department of Environmental Quality. General purpose floor drains which discharge to groundwater are generally prohibited."
➤ Inventory of hazardous substances to be	Yes, section 3.3: "Inventory of hazardous substances to be stored, used or

stored, used or generated on-site, presented in a format acceptable to the local fire marshal (include Chemical Abstracts Service (CAS) numbers).	generated on-site, presented in a format acceptable to the township fire chief (include CAS numbers)."
➤ Descriptions of type of operations proposed for the project and drawings showing size, location, and description of any proposed interior or exterior areas of structures for storing, using, loading or unloading of hazardous substances, hazardous wastes, and/or polluting materials.	Yes, section 3.3: "Descriptions of type of operations proposed for the project and drawings showing size, location and description of any proposed interior or exterior areas of structures for storing, using, loading or unloading of hazardous substances, hazardous wastes and/or polluting materials."
➤ Completion of the Environmental Permits Checklist on the form provided by the Zoning Administrator.	Yes, section 3.3: "Completion of the environmental permits checklist on the form provided by the director of community development."
➤ Does the zoning ordinance contain specific provisions for the on-site handling, storage, use, and manufacture of chemicals?	No
➤ If yes to the previous question, does the zoning ordinance explicitly state that the storage of fuels, chemicals, and other hazardous substances will be stored in a location with an impervious floor that lacks floor drains?	N/A

Interview Questions

This section is to be completed by relying on the community's representatives that are responsible for wellhead and groundwater protection. A combination of the following may be necessary to complete this section, examples of appropriate persons include: planners, engineers, public works officials, and health department representatives. These persons should have access to specific information pertinent to the municipality. Some of the questions listed in this audit tool are specific to mid-Michigan and this particular area. The interview part is divided into three sections: procedural and enforcement, education and outreach, and information sharing and data management. Each of these sections is then broken into specific questions for: wellhead protection and groundwater protection. The answers to these questions will help provide a basis for analyzing wellhead and groundwater protection planning. It is important to note who was interviewed, as well as the date to ensure proper reference.

Interview Subject: Tracy Miller (Director of Community Development, Delhi Township)

Date/Time: 3/16/2011

Location: E-mail Correspondence

Procedural & Enforcement

Wellhead Protection

Question	Response
22) Does the community require onsite inspections of new land uses in WHPAs?	All new land uses require some form of on-site inspection such as a zoning compliance inspection, building inspection, etc., but the Delhi Township does not require a specific inspection that is aimed only at WHP goals.
23) How often are plugged wells inspected?	This is done by the Ingham County Health Department.
24) Is a Phase I Environmental	No, not by the Township. Phase I's are typically required by lenders and are usually

Assessment required before starting development in a WHPA?	done when a new entity acquires a property, but again this is not a specific requirement relative to WHP.
25) How often are new WHPAs assessed and integrated into maps and plans?	The interview subject is not sure about this question and refers to the Tri-County Regional Planning Commission and the Lansing Board of Water and Light (LBWL).

Groundwater Protection

<u>Question</u>	<u>Response</u>
26) Are there any difficulties with the enforceability of any groundwater regulations in the community's zoning ordinance?	No
27) Within the past three years, have any variances been given that affect groundwater regulations?	No
28) Does the community require potentially contaminating land uses to submit contingency plans for emergency response? Do these plans ensure protection from discharges and spills to groundwater?	Yes. A "basic monitoring report" is submitted for each new project. In addition, companies that are potentially contaminating are typically required to file a PIPP (Pollution Incident Prevention Plan) and a FFRTK (Fire Fighter Right-to-Know) report. These detail the potential contaminate sources such as specific chemicals to be stored as well as containment and spill prevention/cleanup procedures.
29) In what instances does the municipality require groundwater monitoring?	The Delhi Township does not specifically require this. Typically this is a state requirement when a site has been identified through the environmental assessment process as being contaminated. The state works with the property owner to develop a cleanup and mitigation plan that would include specifics about groundwater monitoring (frequency, etc.) if necessary.
30) Do you have and use an environmental assessment checklist? How often is this updated?	Yes, the interview subject does not think that it's been updated within the past 5 years. Delhi Township uses the standard Ingham County Environmental Permits Checklist.

Education & Outreach

Wellhead Protection

<u>Question</u>	<u>Response</u>
31) Does the community provide incentives in reporting and plugging private abandoned wells?	Not currently. Delhi Township used to participate in the well capping program via the Tri-County Regional Planning Commission (TCRPC), but that program is no longer funded. They do not provide incentives; however, they require that wells are properly plugged when a property owner seeks connection to the public water supply.
32) Does the community have signs to build awareness about WHPAs?	No, but they have watershed prosecution area signs. They also use signs in the parks and on their manhole covers to alert residents about dumping things in drains and allowing animal waste to accumulate on the ground. They also have several rain gardens that are marked with signage which explains how they work to filter storm water and recharge the aquifers.

Groundwater Protection

<u>Question</u>	<u>Response</u>
33) Has the community ever engaged in a media campaign that promoted groundwater quality? If so, what kind?	Yes, Delhi Township participated with TCRPC and the "Cap Wells" promotions. They also consistently educate residents via their storm water program about the interconnectivity between surface water, storm water, groundwater, wetlands, and drinking water. Examples include the annual "Publicly Owned Treatment Works

	(POTW) Open House” where people are invited to the sewage treatment plant and they specifically talk/educate about this relationship.
34) Is the community actively involved in the Children’s Water Festival?	Not noted

Information Sharing & Data Management

Wellhead Protection

<u>Question</u>	<u>Response</u>
35) When a community delineates a new wellhead protection area, is the information shared with other communities within the 10-year time of travel?	Delhi Township does not delineate the wellhead protection areas. The LBWL provides public drinking water system and the wellhead areas are defined by them.
36) Have any new public wells been drilled in the community since 2005, when the latest delineations occurred?	The interview subject stated ‘no’ to this question, but she referred this to LBWL.

Groundwater Protection

<u>Question</u>	<u>Response</u>
37) Are local groundwater regulations reviewed by a regional authority prior to implementation? Are their standards met?	They participate with the Tri-County Regional Planning Commission on regulations.
38) To whom are questions directed when the community’s zoning administrator or planning staff is in need expert or technical assistance when a question related to groundwater is unknown?	Tri-County Regional Planning Commission
39) How is your community represented on the Groundwater Management Board?	They are participating members and staff regularly attends the meetings.
40) Does your community maintain basic GIS data on wells and WHPA’s?	Yes, they are the same layers that are provided by the state.
41) What is the local department that is primarily responsible for mapping and GIS? Is this data shared with regional and state entities as updates become available?	GIS was, until very recently, housed in our Community Development Department. The GIS responsibilities have been moved to the IT Department due to the expansion of use and implementation of this resource. The GIS professionals in the region regularly work together to ensure data sharing and consistency.

SWOT Analysis

Based on a community's internal (the answers provided from the question-and-answer portion of the audit) and external (demography and geography) factors, an analysis of strengths, weaknesses, opportunities, and threats (SWOT) has been created. This SWOT analysis aids in the identification of barriers and gauge the community's potential room for improvement.

Strengths

- Information shared across agencies and communities
- All new land uses require some form of on-site inspection such as a zoning compliance inspection, building inspection, etc.
- Engagement in a media campaign that promotes groundwater quality

Opportunities

- Expand standard environmental checklist regularly to be more specific to the community
- Fulfill wellhead protection strategy outlined in master plan

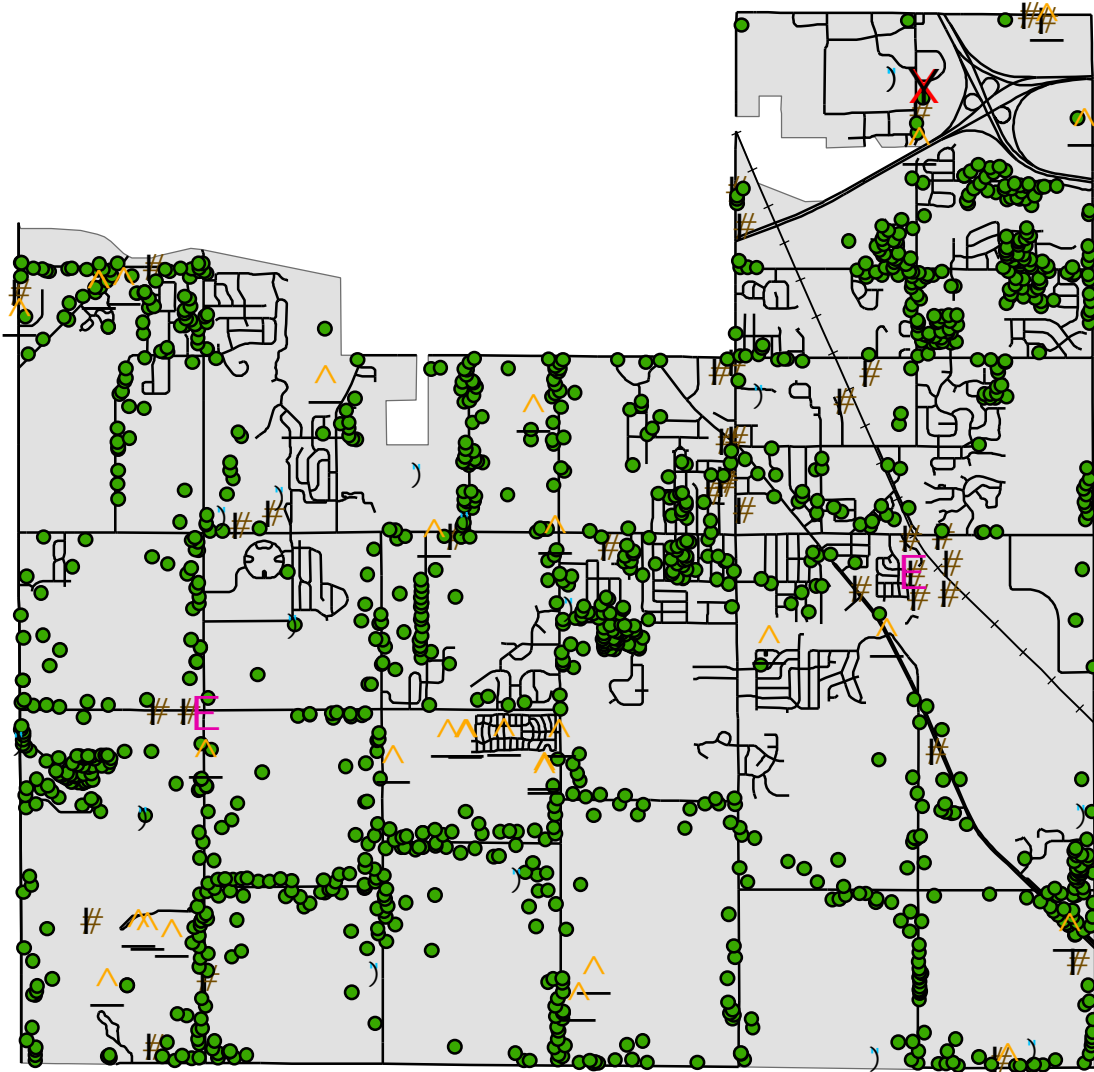
Weaknesses

- No zoning provision for the demolition of structures that include the protection of wells as a standard
- Lack of data of private and abandoned wells
- Does not provide plugging assistance for abandoned wells










Threats

- Reduced state and federal funding threatens local wellhead protection efforts
- No explicit provisions of location for on-site wastewater treatment and disposal systems

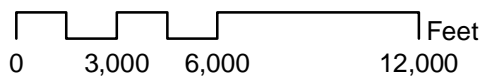
Delhi Charter Township Wells



Legend

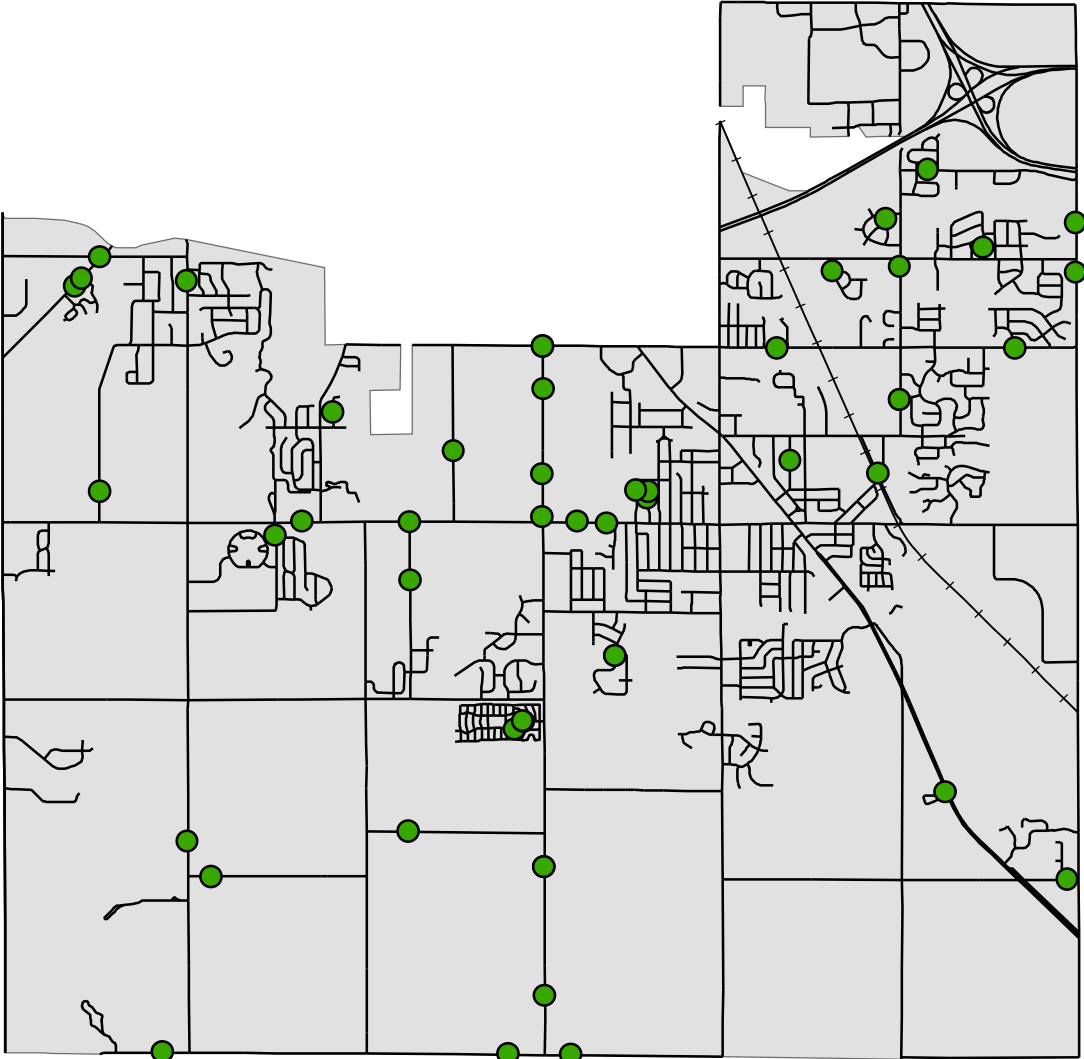
-  Industrial Wells
-  Public Wells
-  Test Wells
-  Irrigation Wells
-  Private Wells
-  Monitoring Wells
-  Road
-  Railroads
-  Delhi Township

4

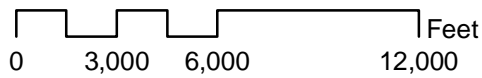


Source: Tri-County Regional Planning Commission and Info Geographics "Wellhead Protection Viewer" Program (November 9th, 2010)

Delhi Charter Township Plugged Wells Since 2005



4



Legend

- Plugged Wells since 2005
- Road
- +— Railroads
- Delhi Township

Source: Tri-County Regional Planning Commission and Info Geographics "Wellhead Protection Viewer" Program (November 9th, 2010)

Findings and Recommendations for
DELTA CHARTER TOWNSHIP

Master Plan

Findings for Delta Township indicate **4 of 8** outcomes have been met. For further improvement, the community can:

- Define WHPAs and reference where to find the most current WHP data and delineations.
- Define WHPAs using local, state, or federal definitions.
- Cite the location of existing and perceived sources of contamination as well as designated Brownfield sites located within the WHPAs.

Zoning Ordinance

Findings for Delta Township indicate **4 of 8** outcomes have been met. For further improvement, the community can:

- Amend zoning ordinance to set limits for volumes of on-site storage of fuel and other potential contaminants.
- Create ordinance provisions for the demolition of buildings that ensure the safeguarding of wells.
- Create zoning provisions that explicitly state that “no discharge to surface water or groundwater, including direct and indirect discharges of waste, waste effluent, wastewater, pollutants, or cooling water, shall be allowed without approval from appropriate state, county and local agencies”.

Site Plan Review

Findings for Delta Township indicate **11 of 12** outcomes have been met. For further improvement, the community can:

- If floor drains are permitted, require that they be connected to subsurface wastewater disposal systems.

General Recommendations

Findings from an interview with Gary Bozek indicate **6 of 11** satisfactory responses. For further improvement, the community can:

- Set standards for when Phase I Environmental Site Assessments are required; make these a requirement for any new development in WHPAs.
- Develop assistance programs (financial and/or technical) for locating and plugging abandoned wells.
- Develop an awareness program for WHPAs that includes signage.
- Gather and maintain basic GIS data on wells and WHPAs.
- Update Contingency Plans

Emergency response is imperative for the prevention of serious contamination issues. Without adequate plans to deal with these situations, detrimental effects can come to ground water and wellhead protection areas. Also, clean up can become increasingly more expensive as time goes on. Fire response must have knowledge of locations with hazardous material in order to handle the emergency correctly. Improper fire control can cause contamination to runoff into groundwater and potentially pollute drinking water. Furthermore, outside externalities, such as a railway spill, must be cleaned promptly and efficiently to ensure the wellbeing of groundwater and wellhead protection areas.

- **Maintain Current Data on Groundwater**

Current and regularly updated groundwater information is important in the maintenance of the community's water quality and usage. Without regular ground water monitoring, issues can arise that would have a much greater impact than if acknowledged early on. Low water levels require a particular response, and without proactive knowledge of this, a well could dry up unnoticed. Furthermore, contamination that is found early will greatly decrease the impact it has on surrounding areas. It is important to maintain these practices of regular upkeep of groundwater data to be knowledgeable of arising issues.

- **Encourage Best Management Practices**

This can be done through media campaigns, public awareness and education programs, as well as by word of mouth. Best management practices are important for mitigation and prevention of potentially hazardous and costly environmental risks. In this case drinking water is at risk of contamination. Local officials can encourage best management practices to assist with preventative wellhead protection planning.

Wellhead and Groundwater Protection Audit Tool: Delta Charter Township

Master Plan

This section is to be completed by relying on the community's master plan document (Delta Charter Township Comprehensive Plan 2004) as well as any supplementary adopted plans. This section is broken into two parts with specific questions for: wellhead protection and groundwater protection. This is done in order to make direct wellhead protection planning clear. The groundwater specific part includes additional questions related to protecting groundwater resources which have an effect on wellheads. These two categories complement each other and help create a more comprehensive overview. Each question is to be answered with citations as to where the information is found in the legal documents to ensure quick access for reference.

Wellhead Protection

Question	Response
1) Are the wellhead protection areas (WHPAs) included in the plan?	No
2) Are WHPAs defined?	No
3) Does the community utilize overlay zones for WHPAs?	No
4) Is there reference to designated Brownfield sites located within WHPAs?	No

Groundwater Protection

Question	Response
5) In the goals and objectives section of the master plan, is the protection of groundwater an issue of importance for the community?	Yes, p.94: "Goal Statement #8: ...Protect and enhance groundwater aquifers, natural recharge areas and surface water resources from contamination."
6) <i>Follow-up:</i> If yes, is the community's strategy for protection noted?	Yes, p.94: "1) Inventory Delta Township's water resources including wetlands, streams, ponds, etc. via the GIS System, 2) Adopt the TCRPC Well Head Management Plan and Ordinance Amendments, 3) Consider adoption of zoning ordinance amendments that would limit the amount of impervious surfaces in commercial developments. Consider a limit on the maximum number of parking spaces above the minimum that can be provided on a site, 4) Consider a stream buffer ordinance to reduce pollution from run-off and erosion, 5) Consider the adoption of a Township Wetlands Protection Ordinance, 6) Recommend Township financing of a well capping program for abandoned private wells, 7) Participate in phase II of the Federal Stormwater Management Program in an effort to improve the quality of stormwater runoff, 8) Support the Eaton County Drain Commissioner in the enforcement of Compiled Rules."
7) Does the plan evaluate and take into account impacts of future land use changes on groundwater?	Yes, pg. 51: "The appearance of West Saginaw and traffic volumes in residential areas were identified as moderate problems. The protection of groundwater was listed as a possible problem. The amount of wetlands and the availability of sidewalks were identified as "not a problem."
8) Does the plan acknowledge the need for a regional effort for groundwater protection?	Yes, pg. 94: "Adopt the TCRPC Well Head Management Plan and Ordinance Amendments"

9) Are specific sites with existing or perceived sources of contamination identified in the plan?

No

Zoning Ordinance

This section is to be completed by relying on the community's zoning ordinance and site plan review documents (Code of Ordinances: Charter Township of Delta, Michigan. Codified through Ordinance No. 10-50, enacted April 19, 2010. (Supplement No. 16)). This section is broken into two parts: general zoning ordinance questions and site plan review assessment. The site plan review is usually located within the zoning ordinance, which is why they are organized accordingly. The general zoning ordinance section is further broken down into questions pertaining to wellhead protection and groundwater protection separately. This is again done in order to make a distinction between wellhead protection planning and the topic of overall groundwater protection planning. The site plan review assessment contains questions specific to new development procedures or land use changes. Each question is to be answered with citations as to where the information is found in the legal documents to ensure quick access for reference.

Wellhead Protection

<u>Question</u>	<u>Response</u>
10) Does the WHPA encompass any districts zoned for medium or heavy industrial uses?	Yes, based on a comparison of zoning maps and WHPA maps.
11) Are abandoned water wells, abandoned monitoring wells and cisterns plugged in accordance with regulations and procedures of the Michigan Department of Environmental Quality as well as the county health department? <i>(Source: Mark Wyckoff Recommendations for Tri-County Communities on WHP Regulations, 2000)</i>	Implied but not explicitly stated. (source: Interview)
12) Do any of the community's ordinances contain regulations on the withdrawal of groundwater (volumes or rates) from industrial/commercial wells?	No
13) Does the zoning ordinance include the definitions of materials deemed to be 'hazardous substances'?	Yes, pg. 18-49: "defined as a chemical or other material which is or may become injurious to the public health, safety, or welfare or to the environment."
14) Are above ground storage tanks certified, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality? <i>(Source: Mark Wyckoff Recommendations for Tri-County Communities on WHP Regulations, 2000)</i>	Implied but not explicitly stated, pg. 18-49: "Material storage and use areas shall be constructed such that no liquid polluting material can escape via gravity through building sewers, drains, or otherwise directly or indirectly into any sewer system or the surface of ground waters... Secondary containment for aboveground areas where hazardous substances are stored or used shall be provided. Secondary containment shall be sufficient to store the substance for the maximum anticipated period of time necessary, for the recovery of any released substance."

<p>15) Are underground storage tanks registered, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality?</p> <p><i>(Source: Mark Wyckoff, Recommendations for Tri-County Communities on WHP Regulations, 2000)</i></p>	<p>Implied but not explicitly stated, pg. 18-49: "Material storage and use areas shall be constructed such that no liquid polluting material can escape via gravity through building sewers, drains, or otherwise directly or indirectly into any sewer system or the surface of ground waters... The use and storage of a Hazardous Substance, defined as a chemical or other material which is or may become injurious to the public health, safety, or welfare or to the environment, shall be identified."</p>
<p>16) Are local regulations present that require bulk storage facilities which house pesticides and fertilizers to be in compliance with Michigan Department of Agriculture requirements?</p> <p><i>(Source: Mark Wyckoff, Recommendations for Tri-County Communities on WHP Regulations, 2000)</i></p>	<p>Implied but not explicitly stated, pg. 6-1: "Land and/or buildings may be utilized for the following uses by Special Land Use approval, subject to the applicable general and specific requirements and standards of Chapter 18... (F) Bulk feed, seed and fertilizer outlets and distribution centers." 18-14: "(1) Parking areas shall be subject to a required front yard setback of thirty-five (35) feet. (2) Parking lots, the nearest edge of which is fifty (50) feet or nearer to a residential district or use, shall be effectively screened by a buffer strip, wall or fence at least three (3) feet above the highest point of the parking lot which it screens. It shall be designed so as not to present a safety hazard for vehicles entering or leaving the site. (3) Exterior storage of equipment or accessory items, display of materials, goods, or supplies shall not take place within thirty-five (35) feet of the front lot line or in any side or rear yard area."</p>
<p>17) Does the zoning ordinance set limits on the volume of fuels able to be stored on-site for land uses other than designated fuel storage areas?</p>	<p>No</p>
<p>18) Are there any provisions in the zoning ordinance for the demolition of buildings that include the management of wells as a standard?</p>	<p>No</p>

Groundwater Protection

<u>Question</u>	<u>Response</u>
<p>19) Are provisions present that explicitly state that no discharge to surface water or groundwater, including direct and indirect discharges of waste, waste effluent, wastewater, pollutants, or cooling water, shall be allowed without approval from appropriate state, county and local agencies?</p> <p><i>(Source: Mark Wyckoff, Recommendations for Tri-County Communities on WHP Regulations, 2000)</i></p>	<p>No</p>
<p>20) Does the zoning ordinance contain provisions for the protection of areas with a high potential for groundwater recharge?</p>	<p>Yes, pg. 19-2 (Site Plan Review Process): The clearing, grading, and balancing of land may commence absent site plan review if all necessary permits have been obtained from the appropriate State or local agencies. The property owner(s) or developer(s) proceed at their own risk despite having a Soil Erosion Permit, due to the fact that subsequent reviews may necessitate modifications to the grades. If deemed necessary, a Soil Erosion and Sedimentation Permit shall be obtained from the Eaton County Drain Commissioner. If regulated floodplains and/or wetlands are located on the property, the applicable permits shall be obtained from the Michigan Department of Natural Resources.</p>

Site Plan Review Assessment

<u>Question</u>	<u>Response</u>
21) Please indicate which of the following conditions/requirements are present for approval of site plans:	
➤ Existing topographic elevations at two (2) foot contour intervals. Indicate direction of drainage flow.	Yes, pg. 19-2: "Application Requirements: ... contours at two foot intervals..." & 19-3: "Proposed grades and site drainage patterns, including existing and proposed drainage structures. Where applicable, indicate the location and elevation(s) of the 100 year floodplain."
➤ The location and elevations of existing water courses and water bodies, including county drains and manmade surface drainageways, floodplains, and wetlands.	Yes, pg. 19-2: "Application Requirements: ... Legal description of site, dimensions of site boundary lines, total site area, water courses and water bodies, and locations of all buildings, driveways, parking areas; and other structures on adjacent properties within one hundred (100) feet of the property, including those located across the street from the property."
➤ Location for on-site wastewater treatment and disposal systems.	Yes, pg. 19-3: "(g) Existing and proposed water supply and wastewater systems locations, including wells."
➤ Location of existing and proposed public and private drinking water wells, monitoring wells, irrigation wells, test wells or wells used for industrial processes.	Yes, pg. 19-3: "(g) Existing and proposed water supply and wastewater systems locations, including wells."
➤ Description and location for any existing or proposed above ground and below ground storage facilities.	Yes, pg. 19-3: "(q) Description and location of existing and proposed above and below ground storage facilities for hazardous substances."
➤ <i>If floor drains are permitted:</i> The location and status of any floor drains in existing or proposed structures on the site. The point of discharge for all drains and pipes shall be specified on the site plan.	Implied but not explicitly stated, pg. 18-49: "Material storage and use areas shall be constructed such that no liquid polluting material can escape via gravity through building sewers, drains, or otherwise directly or indirectly into any sewer system or the surface of ground waters."
➤ <i>If floor drains are permitted:</i> Is it a requirement that they be connected to subsurface wastewater disposal systems?	No
➤ Inventory of hazardous substances to be stored, used or generated on-site, presented in a format acceptable to the local fire marshal (include Chemical Abstracts Service (CAS) numbers).	Yes, pg. 19-3: "(o) Chemical Substances Survey as provided by the Fire Department and an Environmental Checklist as provided by the Planning Department."
➤ Descriptions of type of operations proposed for the project and drawings showing size, location, and description of any proposed interior or exterior areas of structures for storing, using, loading or unloading of hazardous substances, hazardous wastes, and/or polluting materials.	Yes, pg. 19-3: "(p) Description of the type of operations proposed for the project and plans showing the size, location, and description of any proposed areas for storing, use, loading/unloading of hazardous substances and hazardous wastes."
➤ Completion of the Environmental Permits Checklist on the form provided by the Zoning Administrator.	Yes, pg. 19-3: "(o) Chemical Substances Survey as provided by the Fire Department and an Environmental Checklist as provided by the Planning Department."

<p>➤ Does the zoning ordinance contain specific provisions for the on-site handling, storage, use, and manufacture of chemicals?</p>	<p>Yes, pg. 18-49: "(1) The site shall be served by public water and sanitary sewer service. (2) On-site treatment of waste, sludge, or effluent may be required by the Delta Township Utilities Director prior to the placement of such liquids into public sanitary sewers. (3) Material storage and use areas shall be constructed such that no liquid polluting material can escape via gravity through building sewers, drains, or otherwise directly or indirectly into any sewer system or the surface of ground waters. (4) The use and storage of flammable and combustible liquids shall be identified and provided to the Fire Chief. (5) The use and storage of a Hazardous Substance, defined as a chemical or other material which is or may become injurious to the public health, safety, or welfare or to the environment, shall be identified. Secondary containment for aboveground areas where hazardous substances are stored or used shall be provided. Secondary containment shall be sufficient to store the substance for the maximum anticipated period of time necessary, for the recovery of any released substance."</p>
<p>➤ If yes to the previous question, does the zoning ordinance explicitly state that the storage of fuels, chemicals, and other hazardous substances will be stored in a location with an impervious floor that lacks floor drains?</p>	<p>Yes, pg. 18-49: "Material storage and use areas shall be constructed such that no liquid polluting material can escape via gravity through building sewers, drains, or otherwise directly or indirectly into any sewer system or the surface of ground waters."</p>

Interview Questions

This section is to be completed by relying on the community's representatives that are responsible for wellhead and groundwater protection. A combination of the following may be necessary to complete this section, examples of appropriate persons include: planners, engineers, public works officials, and health department representatives. These persons should have access to specific information pertinent to the municipality. Some of the questions listed in this audit tool are specific to mid-Michigan and this particular area. The interview part is divided into three sections: procedural and enforcement, education and outreach, and information sharing and data management. Each of these sections is then broken into specific questions for: wellhead protection and groundwater protection. The answers to these questions will help provide a basis for analyzing wellhead and groundwater protection planning. It is important to note who was interviewed, as well as the date to ensure proper reference.

Interview Subject: Gary Bozek, Senior Planner for Delta Charter Township

Date/Time: March 4th, 2011 10:00AM

Location: Delta Township Hall

Procedural & Enforcement

Wellhead Protection

<u>Question</u>	<u>Response</u>
22) Does the community require onsite inspections of new land uses in WHPAs?	Yes, they are held to the same standards as any development site.
23) How often are plugged wells inspected?	Not often, TCRPC is responsible for this.
24) Is a Phase I Environmental Assessment required before starting	No, but it is required by the project's financial lender.

development in a WHPA?	
25) How often are new WHPAs assessed and integrated into maps and plans?	Not often, TCRPC is responsible for this.

Groundwater Protection

<u>Question</u>	<u>Response</u>
26) Are there any difficulties with the enforceability of any groundwater regulations in the community's zoning ordinance?	No
27) Within the past three years, have any variances been given that affect groundwater regulations?	No
28) Does the community require potentially contaminating land uses to submit contingency plans for emergency response? Do these plans ensure protection from discharges and spills to groundwater?	Yes, it is required by the fire department.
29) In what instances does the municipality require groundwater monitoring?	None specifically, as the state is primarily responsible for this.
30) Do you have and use an environmental assessment checklist? How often is this updated?	Yes, it is managed through Eaton County.

Education & Outreach

Wellhead Protection

<u>Question</u>	<u>Response</u>
31) Does the community provide incentives in reporting and plugging private abandoned wells?	Yes, in paying half of the cost, up to \$600.
32) Does the community have signs to build awareness about WHPAs?	No

Groundwater Protection

<u>Question</u>	<u>Response</u>
33) Has the community ever engaged in a media campaign that promoted groundwater quality? If so, what kind?	No, TCRPC is responsible this.
34) Is the community actively involved in	No, but the Greener Delta event was similar, although recently suspended.

the Children's Water Festival?

Information Sharing & Data Management

Wellhead Protection

<u>Question</u>	<u>Response</u>
35) When a community delineates a new wellhead protection area, is the information shared with other communities within the 10-year time of travel?	No, TCRPC is responsible this.
36) Have any new public wells been drilled in the community since 2005, when the latest delineations occurred?	Unknown, the Health Department is responsible for this.

Groundwater Protection

<u>Question</u>	<u>Response</u>
37) Are local groundwater regulations reviewed by a regional authority prior to implementation? Are their standards met?	Yes, by TCRPC
38) To whom are questions directed when the community's zoning administrator or planning staff is in need expert or technical assistance when a question related to groundwater is unknown?	TCRPC
39) How is your community represented on the Groundwater Management Board?	Gary Bozek serves on the board.
40) Does your community maintain basic data GIS data on wells and WHPA's?	No, but new software is being installed that could make this possible in the future.
41) What is the local department that is primarily responsible for mapping and GIS? Is this data shared with regional and state entities as updates become available?	Engineering and IT departments share this if requested.

SWOT Analysis

Based on a community's internal (the answers provided from the question-and-answer portion of the audit) and external (demography and geography) factors, an analysis of strengths, weaknesses, opportunities, and threats (SWOT) has been created. This SWOT analysis aids in the identification of barriers and gauge the community's potential room for improvement.

Strengths

- Incentives and assistance is available for plugging wells
- All new land uses require some form of on-site inspection
- Information is shared across agencies and communities

Opportunities

- Expand the standard environmental permits checklist regularly to be made specific to the community
- Fulfill the wellhead protection strategy outlined in the master plan

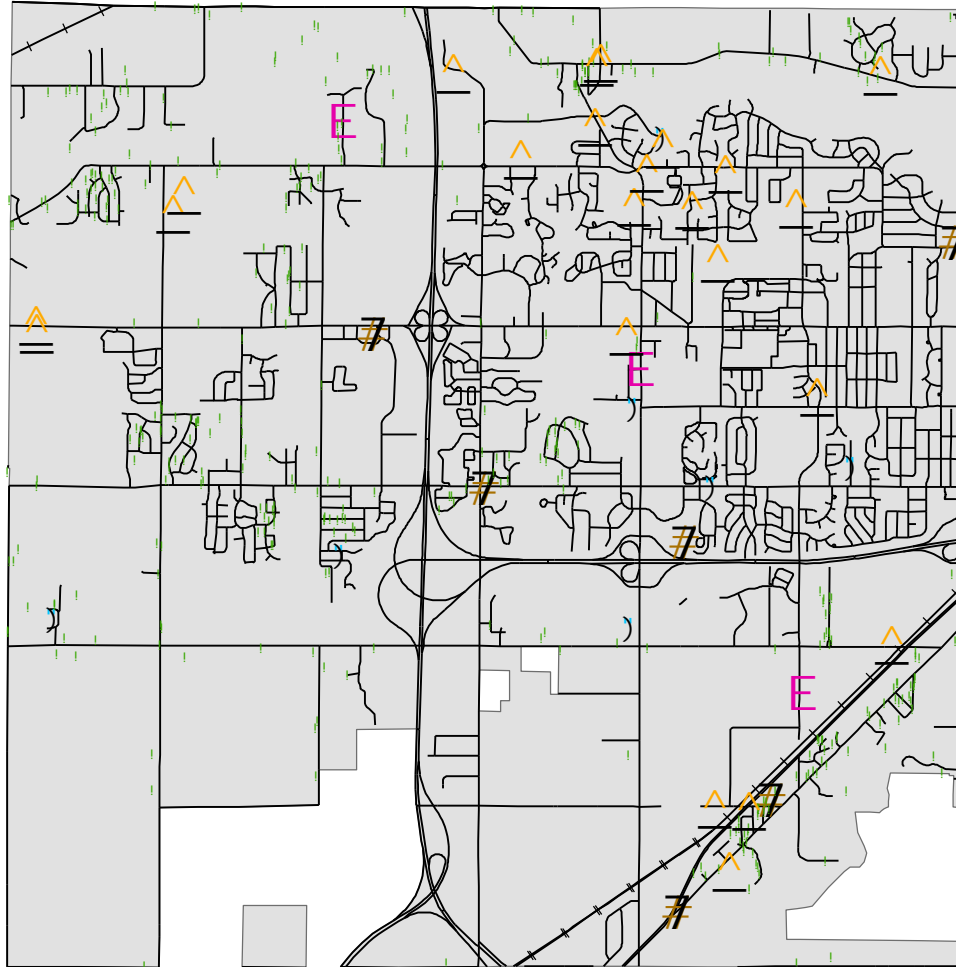
Weaknesses

- Does not maintain an updated environmental checklist
- Regulations are not specifically in line with MDEQ standards
- No zoning provisions for the demolition of a structure that include the protection of wells as a standard
- No locally focused wellhead protection media campaign that promotes education and awareness
- Lack of data on private abandoned wells

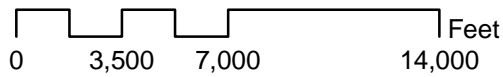
Threats

- Contamination and Brownfield sites are not closely monitored in regards to groundwater safety.
- Reduced state and federal funding threatens local wellhead protection efforts
- Insufficient regulations for floor drains allow for discharge of potentially hazardous materials
- Lacking regulation of discharges in surface water and groundwater
- Medium and heavy industrial zoning districts located within WHPAs









Delta Charter Township Wells



4

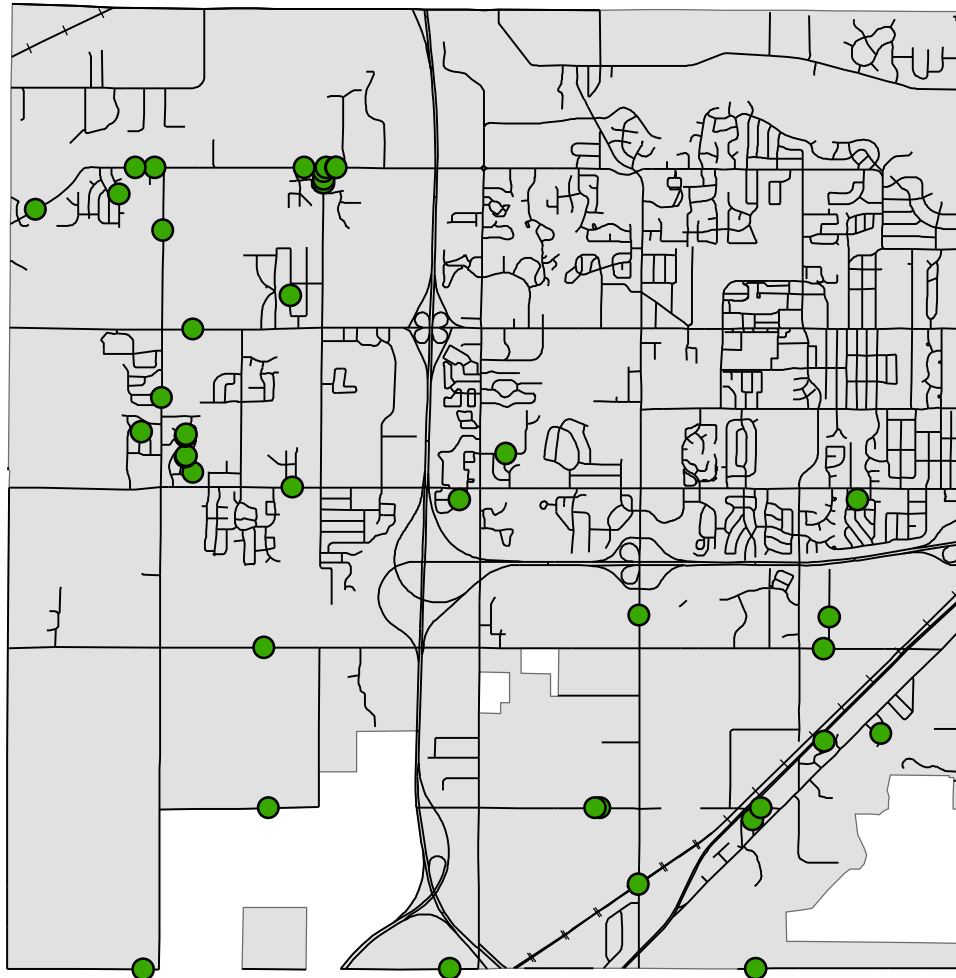


Legend

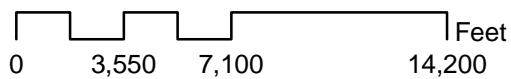
-  Public Wells
-  Private Wells
-  Monitoring Wells
-  Irrigation Wells
-  Industrial Wells
-  Allroads
-  Railroads
-  Delta Charter Township

Source: Tri-County Regional Planning Commission and Info Geographics "Wellhead Protection Viewer" Program (November 9th, 2010)

Delta Charter Township Plugged Wells Since 2005



4



Legend

- Plugged Wells
- Allroads
- + Railroads
- Delta Charter Township

Source: Tri-County Regional Planning Commission and Info Geographics "Wellhead Protection Viewer" Program (November 9th, 2010)

Findings and Recommendations for
THE CITY OF EAST LANSING

Master Plan

Findings for the City of East Lansing indicate **2 of 8** outcomes have been met. For further improvement, the community can:

- Define WHPAs and reference where to find the most current WHP data and delineations
- Define WHPAs using local, state, or federal definitions
- Cite the location of existing and perceived sources of contamination as well as designated Brownfield sites located within the WHPAs
- Create goals and objectives that acknowledge and safeguard groundwater resources, as well as outlined strategies to achieve them
- Acknowledge the relationship between future land use change and groundwater
- Acknowledge the need for a regional effort for groundwater and wellhead protection

Zoning Ordinance

Findings for City of East Lansing indicate **6 of 8** outcomes have been met. For further improvement, the community can:

- Create ordinance provisions for the demolition of buildings that ensure the safeguarding of wells
- Create zoning provisions that explicitly state that “no discharge to surface water or groundwater, including direct and indirect discharges of waste, waste effluent, wastewater, pollutants, or cooling water, shall be allowed without approval from appropriate state, county and local agencies”

Site Plan Review

Findings for City of East Lansing indicate **8 of 12** outcomes have been met. For further improvement, the community can:

- If floor drains are permitted, require that they be connected to subsurface wastewater disposal systems
- Include specific provisions for the on-site handling, storage, use, and manufacture of chemicals that explicitly states that “the storage of fuels, chemicals, and other hazardous substances will be stored in a location with an impervious floor that lacks floor drains”

General Recommendations

Findings from an interview with Timothy Schmitt indicate **7 of 11** satisfactory responses. For further improvement, the community can:

- Set standards for when a Phase I Environmental Site Assessments are required; make these a requirement for any new development in WHPAs.

- If floor drains are permitted, require that they be connected to subsurface wastewater disposal systems
- Include specific provisions for the on-site handling, storage, use, and manufacture of chemicals that explicitly states that “the storage of fuels, chemicals, and other hazardous substances will be stored in a location with an impervious floor that lacks floor drains”
- Require comprehensive on site inspections of new land uses within WHPAs that include the identification of potential threats to groundwater contamination, such as unplugged abandoned wells
- Develop assistance (financial or technical) program for locating and plugging abandoned wells
- Develop an awareness program for WHPAs that includes signage
- Gather and maintain basic GIS data on wells and WHPAs
- Update Contingency Plans

Emergency response is imperative for the prevention of serious contamination issues. Without adequate plans to deal with these situations, detrimental effects can come to ground water and wellhead protection areas. Also, clean up can become increasingly more expensive as time goes on. Fire response must have knowledge of locations with hazardous material in order to handle the emergency correctly. Improper fire control can cause contamination to runoff into groundwater and potentially pollute drinking water. Furthermore, outside externalities, such as a railway spill, must be cleaned promptly and efficiently to ensure the wellbeing of groundwater and wellhead protection areas.
- Maintain Current Data on Groundwater

Current and regularly updated groundwater information is important in the maintenance of the community’s water quality and usage. Without regular ground water monitoring, issues can arise that would have a much greater impact than if acknowledged early on. Low water levels require a particular response, and without proactive knowledge of this, a well could dry up unnoticed. Furthermore, contamination that is found early will greatly decrease the impact it has on surrounding areas. It is important to maintain these practices of regular upkeep of groundwater data to be knowledgeable of arising issues.
- Encourage Best Management Practices

This can be done through media campaigns, public awareness and education programs, as well as by word of mouth. Best management practices are important for mitigation and prevention of potentially hazardous and costly environmental risks. In this case drinking water is at risk of contamination. Local officials can encourage best management practices to assist with preventative wellhead protection planning.

Wellhead and Groundwater Protection Audit Tool: City of East Lansing

Master Plan

This section is to be completed by relying on the community's master plan document (City of East Lansing: Comprehensive Plan for our Future 2006) as well as any supplementary adopted plans. This section is broken into two parts with specific questions for: wellhead protection and groundwater protection. This is done in order to make direct wellhead protection planning clear. The groundwater specific part includes additional questions related to protecting groundwater resources which have an effect on wellheads. These two categories complement each other and help create a more comprehensive overview. Each question is to be answered with citations as to where the information is found in the legal documents to ensure quick access for reference.

Wellhead Protection

<u>Question</u>	<u>Response</u>
1) Are the wellhead protection areas (WHPAs) included in the plan?	No
2) Are WHPAs defined?	No
3) Does the community utilize overlay zones for WHPAs?	No
4) Is there reference to designated Brownfield sites located within WHPAs?	No

Groundwater Protection

<u>Question</u>	<u>Response</u>
5) In the goals and objectives section of the master plan, is the protection of groundwater an issue of importance for the community?	No
6) <i>Follow-up:</i> If yes, is the community's strategy for protection noted?	N/A
7) Does the plan evaluate and take into account impacts of future land use changes on groundwater?	No
8) Does the plan acknowledge the need for a regional effort for groundwater protection?	No
9) Are specific sites with existing or perceived sources of contamination identified in the plan?	Yes, pg. 64

Zoning Ordinance

This section is to be completed by relying on the community's zoning ordinance and site plan review documents (Code of Ordinances: City of East Lansing, Michigan. Codified through Ordinance No. 1242, enacted May 5, 2010. (Supplement No. 9)). This section is broken into two parts: general zoning ordinance questions and site plan review assessment. The site plan review is usually located within the zoning ordinance, which is why they are organized accordingly. The general zoning ordinance section is further broken down into questions pertaining to wellhead protection and groundwater protection separately. This is again done in order to make a distinction between wellhead protection planning and the topic of overall groundwater protection planning. The site plan review assessment contains questions specific to new development procedures or land use changes. Each question is to be answered with citations as to where the information is found in the legal documents to ensure quick access for reference.

Wellhead Protection

Question	Response
10) Does the WHPA encompass any districts zoned for medium or heavy industrial uses?	No
11) Are abandoned water wells, abandoned monitoring wells and cisterns plugged in accordance with regulations and procedures of the Michigan Department of Environmental Quality as well as the county health department?	Yes, section 50-38 part 5 I; "Abandoned water wells (wells that are no longer in use or are in disrepair), abandoned monitoring wells, and cisterns shall be plugged in accordance with regulations and procedures of the Michigan Department of Environmental Quality."
12) Do any of the community's ordinances contain regulations on the withdrawal of groundwater (volumes or rates) from industrial/commercial wells?	No
13) Does the zoning ordinance include the definitions of materials deemed to be 'hazardous substances'?	Yes, section 36-142; " <i>Hazardous material</i> means a substance or combination of substances which, because of its quantity, concentration, or physical, chemical, or infectious characteristics may either cause, or significantly contribute to, an increase in serious reversible and irreversible, or incapacitating illness or pose a substantial present or potential hazard to humans or the environment. "
14) Are above ground storage tanks certified, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality? <i>(Source: Mark Wyckoff Recommendations for Tri-County Communities on WHP Regulations, 2000)</i>	Yes, section 50-38 part 5 G; "Aboveground storage tanks shall be certified, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality."
15) Are underground storage tanks registered, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality? <i>(Source: Mark Wyckoff, Recommendations for Tri-County Communities on WHP Regulations,</i>	Yes, section 50-38 part 5 F; "Underground storage tanks shall be registered, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality."

2000)	
16) Are local regulations present that require bulk storage facilities which house pesticides and fertilizers to be in compliance with Michigan Department of Agriculture requirements? <i>(Source: Mark Wyckoff, Recommendations for Tri-County Communities on WHP Regulations, 2000)</i>	Yes, section 50-38 part 5 H; “Bulk storage facilities for pesticides and fertilizers shall be in compliance with requirements of the Michigan Department of Agriculture.”
17) Does the zoning ordinance set limits on the volume of fuels able to be stored on-site for land uses other than designated fuel storage areas?	No
18) Are there any provisions in the zoning ordinance for the demolition of buildings that include the management of wells as a standard?	Yes, section 20-66; “The provisions in this code shall not be construed to abolish or impair existing remedies of the jurisdiction or its officers or agencies relating to the removal or demolition of any structure which is dangerous, unsafe and insanitary. “

Groundwater Protection

<u>Question</u>	<u>Response</u>
19) Are provisions present that explicitly state that no discharge to surface water or groundwater, including direct and indirect discharges of waste, waste effluent, wastewater, pollutants, or cooling water, shall be allowed without approval from appropriate state, county and local agencies? 20) <i>(Source: Mark Wyckoff, Recommendations for Tri-County Communities on WHP Regulations, 2000)</i>	Yes, section 46-87; “No person shall discharge, or cause to be discharged, into any storm sewer or natural or artificial watercourse, waters or wastes other than stormwater or uncontaminated industrial wastes as heretofore defined.”
21) Does the zoning ordinance contain provisions for the protection of areas with a high potential for groundwater recharge?	Yes, section 49-14; “The site provides protection of subsurface water resources and provision of valuable watersheds and recharging groundwater supplies.”

Site Plan Review Assessment

<u>Question</u>	<u>Response</u>
22) Please indicate which of the following conditions/requirements are present for approval of site plans:	
➤ Existing topographic elevations at two (2) foot contour intervals. Indicate direction of drainage flow.	Yes, section 50-37 part 2 C; “Existing ground contours at two-foot intervals or less, indicating the direction of surface drainage flow, and the type of surface soils present”
➤ The location and elevations of existing water courses and water bodies, including county drains and manmade	Yes, section 50-37 part 2 F & G; “Where wetland of any size may be present, as indicated on the city's wetland inventory map, a report prepared by a qualified wetland consultant which verifies

surface drainageways, floodplains, and wetlands.	the presence of any wetland.”
➤ Location for on-site wastewater treatment and disposal systems.	Yes, section 50-37 part 4 J; “Location of any on-site wastewater collection, treatment and disposal system.”
➤ Location of existing and proposed public and private drinking water wells, monitoring wells, irrigation wells, test wells or wells used for industrial processes.	Yes, section 50-73 part 4 K; “Location of existing and proposed public and private drinking water wells, monitoring wells, irrigation wells, test wells or wells used for industrial processes.”
➤ Description and location for any existing or proposed above ground and below ground storage facilities.	Yes, section 50-37 part 4 N; “Description and location for any existing or proposed aboveground and belowground storage facilities.”
➤ <i>If floor drains are permitted:</i> The location and status of any floor drains in existing or proposed structures on the site. The point of discharge for all drains and pipes shall be specified on the site plan.	Yes, section 30-73 part 4 I; “Location and status of any floor drains in existing or proposed structures on the site, indicating the point of discharge for all drains and pipes.”
➤ <i>If floor drains are permitted:</i> Is it a requirement that they be connected to subsurface wastewater disposal systems?	No
➤ Inventory of hazardous substances to be stored, used or generated on-site, presented in a format acceptable to the local fire marshal (include Chemical Abstracts Service (CAS) numbers).	Yes, section 50-37 part 4 L; “Inventory of hazardous substances to be stored, used or generated on-site, presented in a format acceptable to the local fire marshal (include CAS numbers).”
➤ Descriptions of type of operations proposed for the project and drawings showing size, location, and description of any proposed interior or exterior areas of structures for storing, using, loading or unloading of hazardous substances, hazardous wastes, and/or polluting materials.	Yes, section 50-73 part 4 M; “Descriptions of type of operations proposed for the project and drawings showing size, location, and description of any proposed interior or exterior areas of structures for storing, using, loading or unloading of hazardous substances, hazardous wastes, and/or polluting materials.”
➤ Completion of the Environmental Permits Checklist on the form provided by the Zoning Administrator.	Yes, section 50-73 part 4 O; “Completed environmental permits checklist on the form provided by the planning and zoning official.”
➤ Does the zoning ordinance contain specific provisions for the on-site handling, storage, use, and manufacture of chemicals?	Yes, section 36-146; “The fire chief shall cause to be delivered a copy of this division and a hazardous material disclosure form for completion to any person who, as a result of an inspection by the city, or based on the nature of the enterprise, may be handling, storing, using, processing, or disposing of hazardous materials.”
➤ If yes to the previous question, does the zoning ordinance explicitly state that the storage of fuels, chemicals, and other hazardous substances will be stored in a location with an impervious floor that lacks floor drains.	No

Interview Questions

This section is to be completed by relying on the community's representatives that are responsible for wellhead and groundwater protection. A combination of the following may be necessary to complete this section, examples of appropriate persons include: planners, engineers, public works officials, and health department representatives. These persons should have access to specific information pertinent to the municipality. Some of the questions listed in this audit tool are specific to mid-Michigan and this particular area. The interview part is divided into three sections: procedural and enforcement, education and outreach, and information sharing and data management. Each of these sections is then broken into specific questions for: wellhead protection and groundwater protection. The answers to these questions will help provide a basis for analyzing wellhead and groundwater protection planning. It is important to note who was interviewed, as well as the date to ensure proper reference.

Interview Subject: *Timothy R. Schmitt, AICP (Associate Planner at City of East Lansing)*

Date/Time: *March 23rd, 2011 10:00AM*

Location: *East Lansing City Hall*

Procedural & Enforcement

Wellhead Protection

<u>Question</u>	<u>Response</u>
23) Does the community require onsite inspections of new land uses in WHPAs?	Yes. The city is onsite almost daily on any new construction.
24) How often are plugged wells inspected?	They are not.
25) Is a Phase I Environmental Assessment required before starting development in a WHPA?	Yes. For any project the city is involved in a Phase I is required. If it is out of their jurisdiction, it is not necessary but is usually completed regardless.
26) How often are new WHPAs assessed and integrated into maps and plans?	No new WHPAs have been created since the last update to the comprehensive plan. If there were to be any, they would be included when the comprehensive plan was updated.

Groundwater Protection

<u>Question</u>	<u>Response</u>
27) Are there any difficulties with the enforceability of any groundwater regulations in the community's zoning ordinance?	No.
28) Within the past three years, have any variances been given that affect groundwater regulations?	No.
29) Does the community require potentially	Yes. It begins with a written description of the use and then details are submitted to

contaminating land uses to submit contingency plans for emergency response? Do these plans ensure protection from discharges and spills to groundwater?	the fire department and a PIPP is drafted.
30) In what instances does the municipality require groundwater monitoring?	There are few uses that would require this besides gas stations. East Lansing has little industrial use and therefore this is not necessary an issue. If anything came up, it would be implemented.
31) Do you have and use an environmental assessment checklist? How often is this updated?	Yes. Part of the Building Permits checklist. It needs to be updated

Education & Outreach

Wellhead Protection

<u>Question</u>	<u>Response</u>
32) Does the community provide incentives in reporting and plugging private abandoned wells?	No.
33) Does the community have signs to build awareness about WHPAs?	Yes. WHPAs, riversheds and parks.

Groundwater Protection

<u>Question</u>	<u>Response</u>
34) Has the community ever engaged in a media campaign that promoted groundwater quality? If so, what kind?	Yes. Published articles in the Curbside Journal, Dialog and on the City website.
35) Is the community actively involved in the Children's Water Festival?	Yes. The public schools participate.

Information Sharing & Data Management

Wellhead Protection

<u>Question</u>	<u>Response</u>
36) When a community delineates a new wellhead protection area, is the information shared with other communities within the 10-year time of travel?	Yes. Mainly with Meridian because they have a joint water plan.
37) Have any new public wells been drilled in the community since 2005, when the latest delineations occurred?	No.

Groundwater Protection

<u>Question</u>	<u>Response</u>
38) Are local groundwater regulations reviewed by a regional authority prior to implementation? Are their standards met?	Yes. Multiple groups review this.
39) To whom are questions directed when the community's zoning administrator or planning staff is in need expert or technical assistance when a question related to groundwater is unknown?	Begins with the in-house engineers. They usually have the answer for any question.
40) How is your community represented on the Groundwater Management Board?	By the in-house engineers and by myself.
41) Does your community maintain basic data GIS data on wells and WHPA's?	Not sure.
42) What is the local department that is primarily responsible for mapping and GIS? Is this data shared with regional and state entities as updates become available?	Public Works. Yes, but it must be requested.

SWOT Analysis

Based on a community's internal (the answers provided from the question-and-answer portion of the audit) and external (demography and geography) factors, an analysis of strengths, weaknesses, opportunities, and threats (SWOT) has been created. This SWOT analysis aids in the identification of barriers and gauge the community's potential room for improvement.

Strengths

- Actively promotes education and awareness to all citizens regarding WHPAs through many different media campaigns
- Zoning ordinance has strong environmental protection restrictions
- The city has used public water for a prolonged period of time and therefore has few abandoned or private wells within their city limits
- Information is shared across agencies and communities
- All new land uses require some form of on-site inspection such as a zoning compliance inspection, building inspection, etc.

Opportunities

- Expand standard environmental permits checklist regularly to be more specific to the community

Weaknesses

- Master Plan has no reference to groundwater protection and WHPAs or their definitions
- No goals or objectives to protect groundwater through WHPAs
- Does not provide plugging assistance for abandoned wells
- Lack of data on private and abandoned wells
- No zoning provision for the demolition of structures that include the protection of wells as a standard

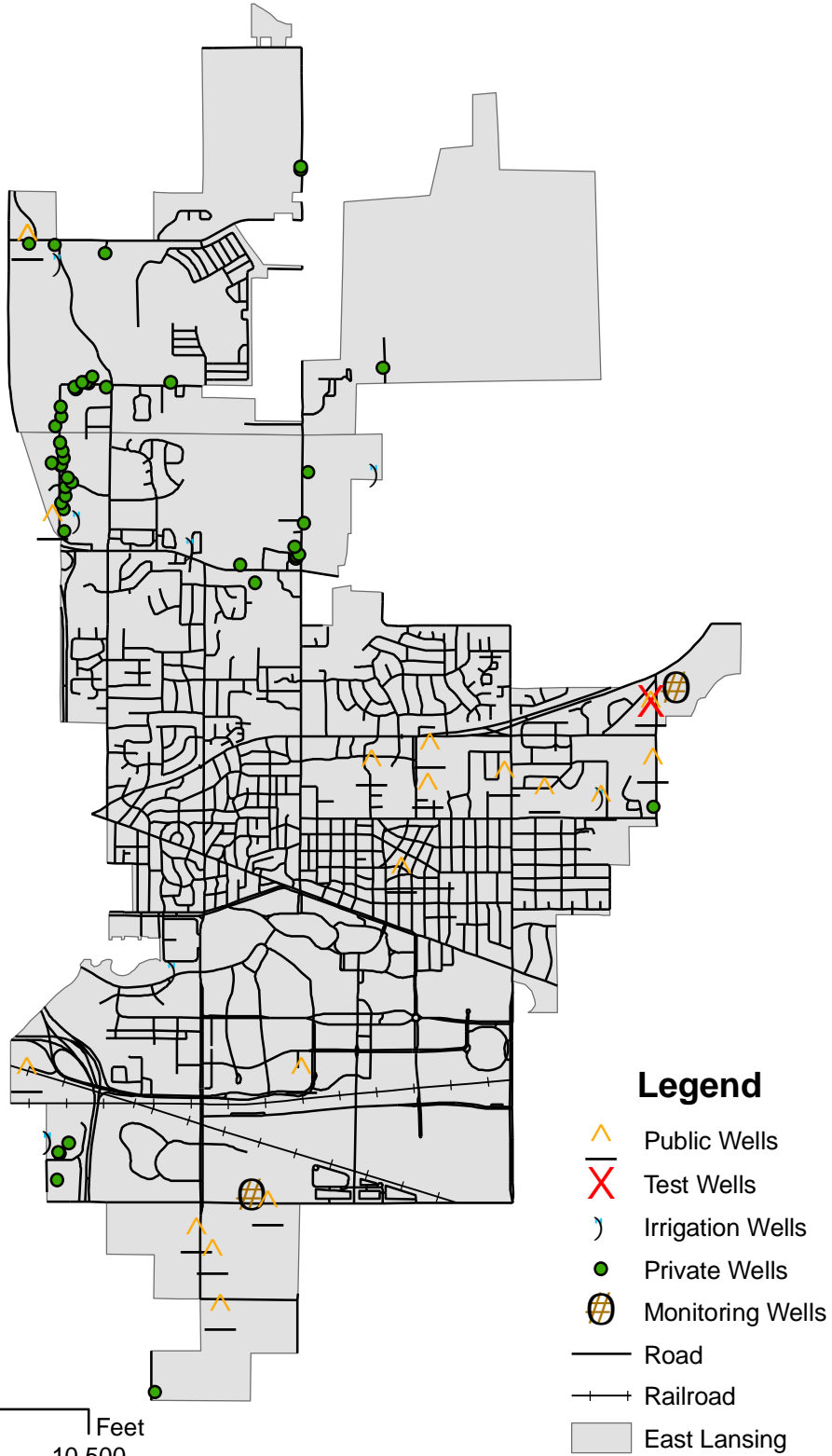
Threats

- Contamination and Brownfield sites are not closely monitored in regard to groundwater safety
- Reduced state and federal funding threatens local

wellhead protection efforts

- Insufficient regulations for floor drains allow for discharge of potentially hazardous materials

East Lansing Wells

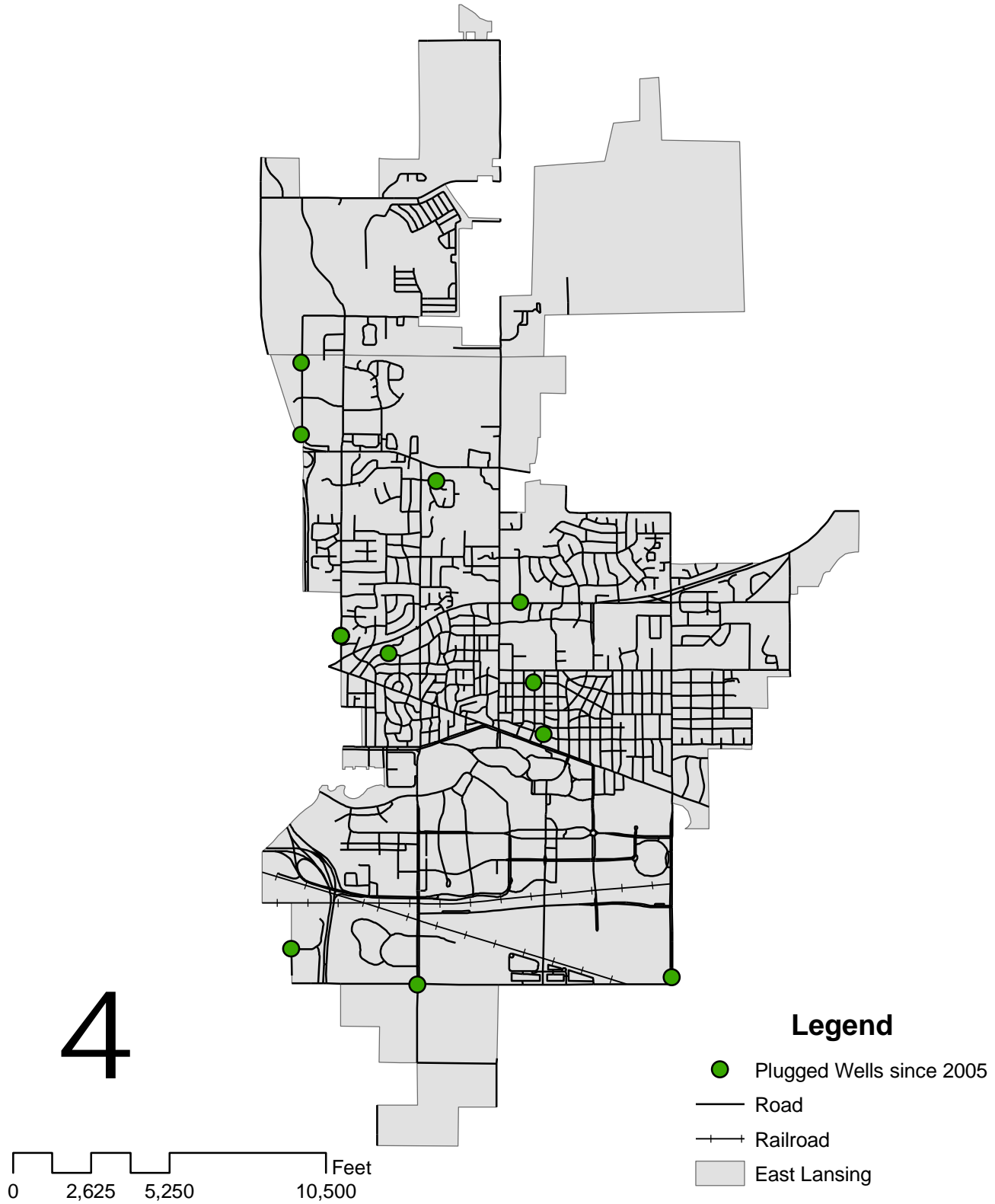


4

0 2,625 5,250 10,500 Feet

Source: Tri-County Regional Planning Commission and Info Geographics "Wellhead Protection Viewer" Program (November 9th, 2010)

East Lansing Plugged Wells Since 2005



Source: Tri-County Regional Planning Commission and Info Geographics "Wellhead Protection Viewer" Program (November 9th, 2010)

Findings and Recommendations for
THE CITY OF LANSING

Master Plan

Findings for Lansing indicate **1 of 8** outcomes have been met. For further improvement, the community can:

- Define WHPAs and reference where to find the most current WHP data and delineations
- Cite the location of existing and perceived sources of contamination as well as designated Brownfield sites located within the WHPAs
- Acknowledge the general location of public and large scale irrigation wells are managed and monitored.
- Acknowledge the relationship between future land use change and groundwater.
- Create goals and objectives that acknowledge and safeguard groundwater resources, as well as outlined strategies to achieve them.

Zoning Ordinance

Findings for Lansing indicate **6 of 8** outcomes have been met. For further improvement, the community can:

- If the WHPA encompasses medium or heavy industrial zoning districts, begin to phase out these districts in favor of those with less potential for contamination
- Amend zoning ordinance to set limits for volumes of on-site storage of fuel and other potential contaminants.

Site Plan Review

Findings for Lansing indicate **10 of 12** outcomes have been met. For further improvement, the community can:

- Include provisions for the on-site handling, storage, use, and manufacture of chemicals
- Include specific provisions for the on-site handling, storage, use, and manufacture of chemicals that explicitly states that “the storage of fuels, chemicals, and other hazardous substances will be stored in a location with an impervious floor that lacks floor drains.

General Recommendations

Findings from an interview with Bill Rieskie indicate **8 of 11** satisfactory responses. For further improvement, the community can:

- Require comprehensive on site inspections of new land uses within WHPAs that include the identification of potential threats to groundwater contamination, such as unplugged abandoned wells
- Set standard for when a Phase I ESA is required; make these a requirement for any new development in WHPAs.
- Develop assistance (financial or technical) program for locating and plugging abandoned wells.
- Develop awareness program for WHPAs that includes signage.

- **Update Contingency Plans**

Emergency response is imperative for the prevention of serious contamination issues. Without adequate plans to deal with these situations, detrimental effects can come to ground water and wellhead protection areas. Also, clean up can become increasingly more expensive as time goes on. Fire response must have knowledge of locations with hazardous material in order to handle the emergency correctly. Improper fire control can cause contamination to runoff into groundwater and potentially pollute drinking water. Furthermore, outside externalities, such as a railway spill, must be cleaned promptly and efficiently to ensure the wellbeing of groundwater and wellhead protection areas.
- **Maintain Current Data on Groundwater**

Current and regularly updated groundwater information is important in the maintenance of the community's water quality and usage. Without regular ground water monitoring, issues can arise that would have a much greater impact than if acknowledged early on. Low water levels require a particular response, and without proactive knowledge of this, a well could dry up unnoticed. Furthermore, contamination that is found early will greatly decrease the impact it has on surrounding areas. It is important to maintain these practices of regular upkeep of groundwater data to be knowledgeable of arising issues.
- **Encourage Best Management Practices**

This can be done through media campaigns, public awareness and education programs, as well as by word of mouth. Best management practices are important for mitigation and prevention of potentially hazardous and costly environmental risks. In this case drinking water is at risk of contamination. Local officials can encourage best management practices to assist with preventative wellhead protection planning.

Wellhead and Groundwater Protection Audit Tool: City of Lansing

Master Plan

This section is to be completed by relying on the community's master plan document (City of Lansing: Comprehensive Master Plan 1958) as well as any supplementary adopted plans. This section is broken into two parts with specific questions for: wellhead protection and groundwater protection. This is done in order to make direct wellhead protection planning clear. The groundwater specific part includes additional questions related to protecting groundwater resources which have an effect on wellheads. These two categories complement each other and help create a more comprehensive overview. Each question is to be answered with citations as to where the information is found in the legal documents to ensure quick access reference.

Wellhead Protection

<u>Question</u>	<u>Response</u>
1) Are the wellhead protection areas (WHPAs) included in the plan?	No
2) Are WHPAs defined?	N/A
3) Does the community utilize overlay zones for WHPAs?	No
4) Is there reference to designated Brownfield sites located within WHPAs?	No

Groundwater Protection

<u>Question</u>	<u>Response</u>
5) In the goals and objectives section of the master plan, is the protection of groundwater an issue of importance for the community?	No
6) <i>Follow-up:</i> If yes, is the community's strategy for protection noted?	N/A
7) Does the plan evaluate and take into account impacts of future land use changes on groundwater?	Partially, pg. 41 "Public Utilities - No great difficulty is anticipated in Lansing in extending the water system to accommodate expected future growth. Residential development should be permitted only where it can readily be serviced with such facilities as sewer and water. Developing Areas - In these areas the principal residential growth of the future is expected. Adequate public facilities, such as paved streets, water and sewers, recreation areas, and schools should be provided."
8) Does the plan acknowledge the need for a regional effort for groundwater protection?	No
9) Are specific sites with existing or perceived sources of contamination identified in the plan?	No

Zoning Ordinance

This section is to be completed by relying on the community's zoning ordinance and site plan review documents (Code of Ordinances: Lansing, Michigan. Codified through Ordinance No. 1158, enacted August 30, 2010. (Supplement No. 31)). This section is broken into two parts: general zoning ordinance questions and site plan review assessment. The site plan review is usually located within the zoning ordinance, which is why they are organized accordingly. The general zoning ordinance section is further broken down into questions pertaining to wellhead protection and groundwater protection separately. This is again done in order to make a distinction between wellhead protection planning and the topic of overall groundwater protection planning. The site plan review assessment contains questions specific to new development procedures or land use changes. Each question is to be answered with citations as to where the information is found in the legal documents to ensure quick access for reference.

Wellhead Protection

Question	Response
10) Does the WHPA encompass any districts zoned for medium or heavy industrial uses?	Yes, based on a comparison on Lansing's WHPA map and zoning map, many heavy industrial zones reside within the WHPA
11) Are abandoned water wells, abandoned monitoring wells and cisterns plugged in accordance with regulations and procedures of the Michigan Department of Environmental Quality as well as the county health department? <i>(Source: Mark Wyckoff Recommendations for Tri-County Communities on WHP Regulations, 2000)</i>	Yes, section 1242.07 (v), "Abandoned water wells (wells that are no longer in use or are in disrepair), abandoned monitoring wells, and cisterns shall be immediately repaired or "formally abandoned" in accordance with regulations and procedures of the Michigan Department of Environmental Quality and the Ingham County Health Department. The level of repair for irrigation wells shall meet the same standards as the rules and procedures required by the Michigan Department of Environmental Quality for potable water, except as to depth."
12) Do any of the community's ordinances contain regulations on the withdrawal of groundwater (volumes or rates) from industrial/commercial wells?	No
13) Does the zoning ordinance include the definitions of materials deemed to be 'hazardous substances'?	Yes, section 1612.02, "'Hazardous material" means explosive, pyrotechnics, compressed gas, flammable liquid, flammable solid, combustible liquid, oxidizing material, poisonous gas, poisonous liquid, poisonous solid, irritating material, etiological material, radioactive material, corrosive material or liquefied petroleum gas and also including, but not limited to, any of the following: 1. Any material, listed in the list of toxic pollutants found in 40 CFR 401.15, as amended, or in any other federal law or regulation; 2. Any material regulated as an hazardous material by the United States Department of Transportation through regulations found in 49 CFR 171.1 et seq.; 3. Any material designated as hazardous material by state or federal law or regulation, or City Ordinance; or, 4. Any otherwise nonhazardous material released is a hazardous material for purposes of this ordinance if its presence causes a potential hazard to vehicular or pedestrian traffic."
14) Are above ground storage tanks certified, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality? <i>(Source: Mark Wyckoff Recommendations for Tri-County Communities on WHP Regulations,</i>	Yes, section 1242.07 (t), " Above ground storage tanks shall be certified, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality."

2000)	
15) Are underground storage tanks registered, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality? <i>(Source: Mark Wyckoff, Recommendations for Tri-County Communities on WHP Regulations, 2000)</i>	Yes, section 1242.07 (s), "Underground storage tanks shall be registered, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality."
16) Are local regulations present that require bulk storage facilities which house pesticides and fertilizers to be in compliance with Michigan Department of Agriculture requirements? <i>(Source: Mark Wyckoff, Recommendations for Tri-County Communities on WHP Regulations, 2000)</i>	Yes, section 1242.07 (u), "Bulk storage facilities for pesticides and fertilizers shall be in compliance with requirements of the Michigan Department of Agriculture."
17) Does the zoning ordinance set limits on the volume of fuels able to be stored on-site for land uses other than designated fuel storage areas?	No
18) Are there any provisions in the zoning ordinance for the demolition of buildings that include the management of wells as a standard?	Yes, section 1242.04 (11) , "Demolition of any structure that is listed as a Michigan 201 Site and/or has old wells or septic systems."

Groundwater Protection

<u>Question</u>	<u>Response</u>
19) Are provisions present that explicitly state that no discharge to surface water or groundwater, including direct and indirect discharges of waste, waste effluent, wastewater, pollutants, or cooling water, shall be allowed without approval from appropriate state, county and local agencies? <i>(Source: Mark Wyckoff, Recommendations for Tri-County Communities on WHP Regulations, 2000)</i>	Yes, section 1242.07 (q) "Sites at which hazardous substances, hazardous wastes, or potentially polluting materials are stored, used, or generated shall be designed in such a manner as to prevent spills and discharges of such materials to the air, surface of the ground, groundwater, lakes, streams, rivers or wetlands. Such facilities shall not have general purpose floor drains."
20) Does the zoning ordinance contain provisions for the protection of areas with a high potential for groundwater recharge?	No

Site Plan Review Assessment

<u>Question</u>	<u>Response</u>
21) Please indicate which of the following conditions/requirements are present for approval of site plans:	
➤ Existing topographic elevations at two (2) foot contour intervals. Indicate direction of drainage flow.	Yes, section 1242.05 (9), "Existing and proposed land elevations and/or contours to appropriately illustrate topography and to indicate direction of drainage flow; and location map."
➤ The location and elevations of existing water courses and water bodies, including county drains and manmade surface drainageways, floodplains, and wetlands.	Yes, section 1242.05 (11) "The location and elevations of existing water courses and water bodies, including county drains and manmade surface drainageways, floodplains, and wetlands."
➤ Location for on-site wastewater treatment and disposal systems.	Yes, section 1242.05 (14), "Location of any on-site wastewater treatment and disposal systems."
➤ Location of existing and proposed public and private drinking water wells, monitoring wells, irrigation wells, test wells or wells used for industrial processes.	Yes, section 1242.05 (15), "Location of existing and proposed electric services, fire hydrants, public water mains, public and private drinking water wells, monitoring wells, irrigation wells, test wells or wells used for industrial processes."
➤ Description and location for any existing or proposed above ground and below ground storage facilities.	Yes, section 1242.05 (18), "Description and location for any existing or proposed above ground and below ground storage facilities."
➤ <i>If floor drains are permitted:</i> The location and status of any floor drains in existing or proposed structures on the site. The point of discharge for all drains and pipes shall be specified on the site plan.	Yes*, section 1242.07 "(p) General purpose floor drains shall be connected to a public sanitary/combined sewer system or an on-site holding tank (not a septic system) in accordance with state, county and municipal requirements, unless a groundwater discharge permit has been obtained from the Michigan Department of Environmental Quality. General purpose floor drains which discharge to groundwater are generally prohibited. (q) Sites at which hazardous substances, hazardous wastes, or potentially polluting materials are stored, used, or generated shall be designed in such a manner as to prevent spills and discharges of such materials to the air, surface of the ground, groundwater, lakes, streams, rivers or wetlands. Such facilities shall not have general purpose floor drains."
➤ <i>If floor drains are permitted:</i> Is it a requirement that they be connected to subsurface wastewater disposal systems?	Yes, section 1242.07 (q), "General purpose floor drains shall be connected to a public sanitary/combined sewer system or an on-site holding tank (not a septic system) in accordance with state, county and municipal requirements, unless a groundwater discharge permit has been obtained from the Michigan Department of Environmental Quality. General purpose floor drains which discharge to groundwater are generally prohibited."
➤ Inventory of hazardous substances to be stored, used or generated on-site, presented in a format acceptable to the local fire marshal (include Chemical Abstracts Service (CAS) numbers).	Yes, section 1242.05 (16), "Inventory of hazardous substances in quantities greater than what is typically kept for general cleaning, to be stored, used or generated on-site, presented in a format acceptable to the city fire marshal (include CAS numbers)"
➤ Descriptions of type of operations proposed for the project and drawings showing size, location, and description of any proposed interior or exterior areas of structures for storing, using, loading or	Yes, section 1242.05 (17), "Description of type of operations proposed for the project and drawings showing size, location, and description of any proposed interior or exterior areas of structures for storing, using, loading or unloading of hazardous substances, hazardous wastes, polluting materials and/or flammable and combustible materials."

unloading of hazardous substances, hazardous wastes, and/or polluting materials.	
➤ Completion of the Environmental Permits Checklist on the form provided by the Zoning Administrator.	Yes, section 1242.05 (20), "Completion of the environmental permits checklist on the form provided by the Zoning Administrator."
➤ Does the zoning ordinance contain specific provisions for the on-site handling, storage, use, and manufacture of chemicals?	No
➤ If yes to the previous question, does the zoning ordinance explicitly state that the storage of fuels, chemicals, and other hazardous substances will be stored in a location with an impervious floor that lacks floor drains?	N/A

Interview Questions

This section is to be completed by relying on the community's representatives that are responsible for wellhead and groundwater protection. A combination of the following may be necessary to complete this section, examples of appropriate persons include: planners, engineers, public works officials, and health department representatives. These persons should have access to specific information pertinent to the municipality. Some of the questions listed in this audit tool are specific to mid-Michigan and this particular area. The interview part is divided into three sections: procedural and enforcement, education and outreach, and information sharing and data management. Each of these sections is then broken into specific questions for: wellhead protection and groundwater protection. The answers to these questions will help provide a basis for analyzing wellhead and groundwater protection planning. It is important to note who was interviewed, as well as the date to ensure proper reference.

Interview Subject: *William Rieske AICP (Assistant Planning Manager at City of Lansing)*

Date/Time: *March 2nd, 2011 10:00AM*

Location: *Lansing Planning Office*

Procedural & Enforcement

Wellhead Protection

<u>Question</u>	<u>Response</u>
22) Does the community require onsite inspections of new land uses in WHPAs?	Yes, Building safety dept and public service at certain times, not just Wellhead Protection Areas
23) How often are plugged wells inspected?	Managed by Lansing Board of Water and Light
24) Is a Phase I Environmental Assessment required before starting development in a WHPA?	They are required at property acquisitions, but not by the city.
25) How often are new WHPAs assessed and integrated into maps and plans	Yearly, by the Groundwater Management Board

Groundwater Protection

<u>Question</u>	<u>Response</u>
26) Are there any difficulties with the enforceability of any groundwater regulations in the community's zoning ordinance?	No
27) Within the past three years, have any variances been given that affect groundwater regulations?	No
28) Does the community require potentially contaminating land uses to submit contingency plans for emergency response? Do these plans ensure protection from discharges and spills to groundwater?	The Fire Department manages contingency plans for emergency response.
29) In what instances does the municipality require groundwater monitoring?	Lansing Board of Water and Light
30) Do you have and use an environmental assessment checklist? How often is this updated?	Lansing uses the standard Ingham County Environmental Permits Checklist

Education & Outreach

Wellhead Protection

<u>Question</u>	<u>Response</u>
31) Does the community provide incentives in reporting and plugging private abandoned wells?	No, this is done by the Health Department
32) Does the community have signs to build awareness about WHPAs?	No

Groundwater Protection

<u>Question</u>	<u>Response</u>
33) Has the community ever engaged in a media campaign that promoted groundwater quality? If so, what kind?	Yes, Water fest, PSA's before movies, Groundwater model at impression 5 science museum
34) Is the community actively involved in the Children's Water Festival?	Yes

Information Sharing & Data Management

Wellhead Protection

<u>Question</u>	<u>Response</u>
35) When a community delineates a new wellhead protection area, is the information shared with other communities within the 10-year time of travel?	Yes
36) Have any new public wells been drilled in the community since 2005, when the latest delineations occurred?	Not to his knowledge

Groundwater Protection

<u>Question</u>	<u>Response</u>
37) Are local groundwater regulations reviewed by a regional authority prior to implementation? Are their standards met?	Yes, they are reviewed by the Lansing Board of Water and Light as well as the Tri-County Regional Planning Board
38) To whom are questions directed when the community's zoning administrator or planning staff is in need expert or technical assistance when a question related to groundwater is unknown?	Staff at BWL and Tri-County
39) How is your community represented on the Groundwater Management Board?	Mr Rieski as well as BWL representatives appear on the board
40) Does your community maintain basic data GIS data on wells and WHPA's?	Yes
41) What is the local department that is primarily responsible for mapping and GIS? Is this data shared with regional and state entities as updates become available?	Info tech office from finance dept. WHP is done by USGS

SWOT Analysis

Based on a community's internal (the answers provided from the question-and-answer portion of the audit) and external (demography and geography) factors, an analysis of strengths, weaknesses, opportunities, and threats (SWOT) has been created. This SWOT analysis aids in the identification of barriers and gauge the community's potential room for improvement.

Strengths

- Relationship with LBWL helps to alleviate responsibilities for WHP planning
- Maintains current GIS department coordination with regional authorities
- Strong regulations for the storage of hazardous materials
- The city has used public water for a prolonged period of time and therefore has few abandoned or private wells within the city
- All new property acquisitions require on-site building and public service inspections
- Community has engaged in an education program to promote wellhead protection

Weaknesses

- Total reliance on LBWL for water needs and regulations
- There is no reference to wellhead and groundwater protection in the current master plan
- Does not maintain a regularly updated environmental checklist
- Does not have a locally focused Wellhead Protection media strategy promoting education and awareness
- Does not provide plugging assistance for abandoned wells
- Zoning ordinance is lacking provisions specific to wellhead protection plans
- Lack of data on private abandoned wells
- Lack of plugging assistance and regulations
- Low level of collaboration between the City of Lansing and Lansing Township

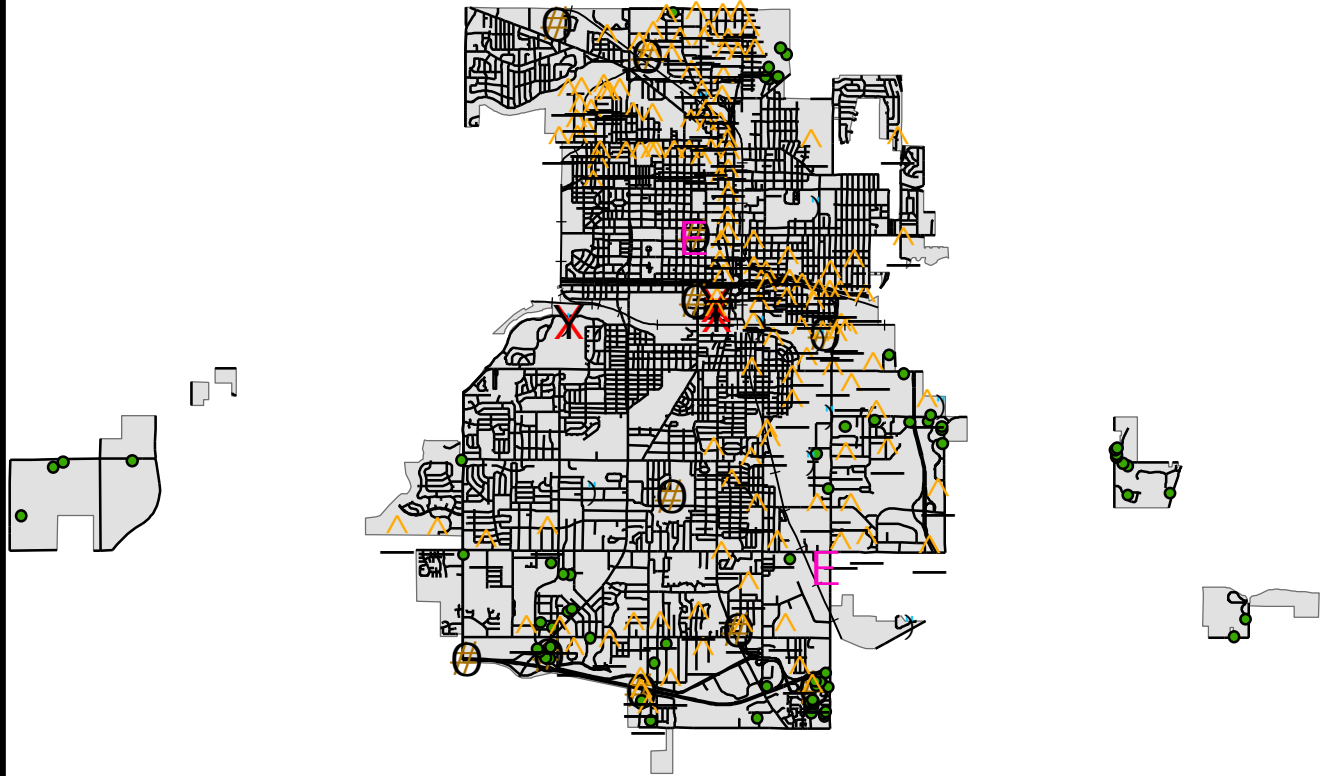
Opportunities

- Expansion for wellhead and groundwater protection concepts in upcoming master plan update
- Expansion of education and community outreach programs
- Expand standard County environmental assessments checklist regularly to be more specific to the community










Threats

- Contamination issues do not have proper municipal regulations for a prompt and thorough response
- Lack of plugging regulations
- Reduced state and federal funding threatens local wellhead protection efforts
- Contamination and brownfield sites are not closely monitored in regards to groundwater safety
- Medium and heavy industrial zoning districts are located within WHPAs

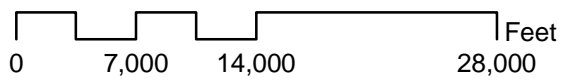
City of Lansing Wells



Legend

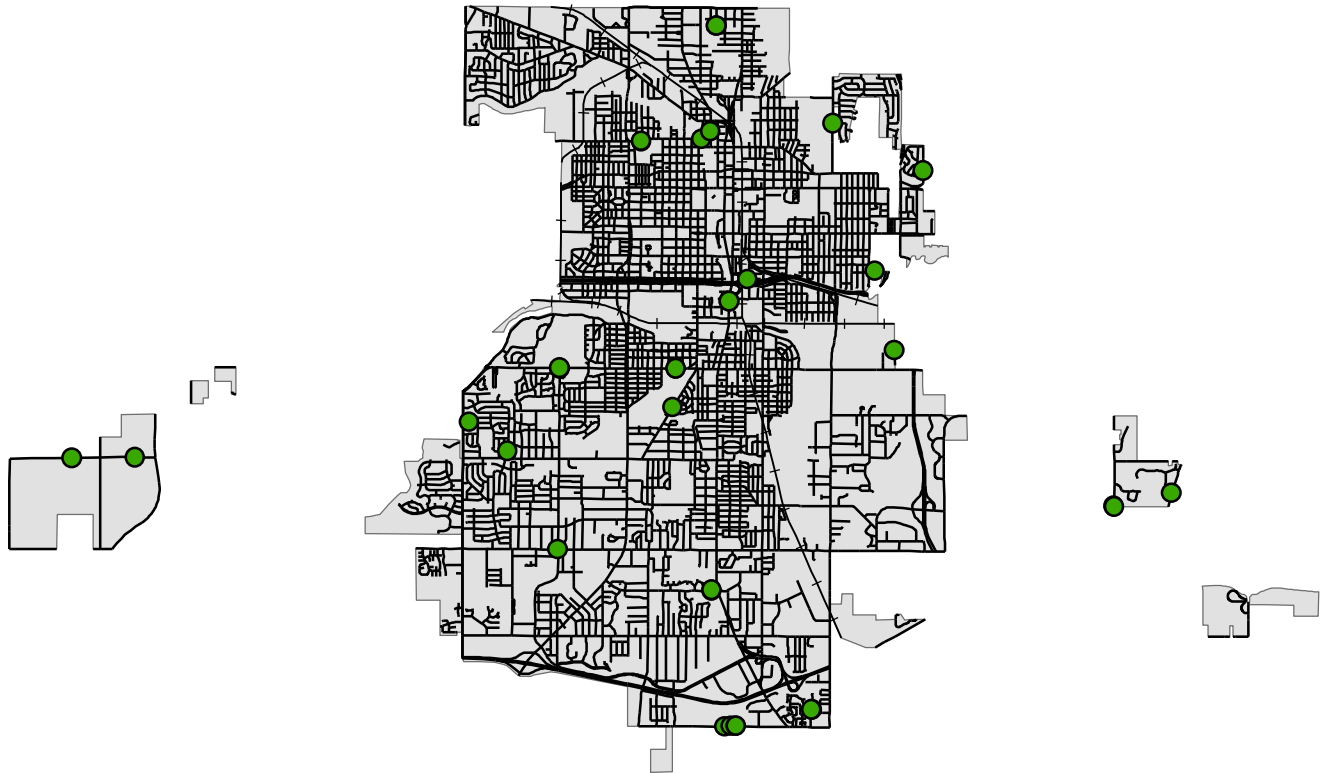
-  Industrial Wells
-  Public Wells
-  Test Wells
-  Irrigation Wells
-  Private Wells
-  Monitoring Wells
-  Roads
-  Rail Roads
-  City of Lansing

4

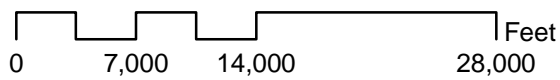


Source: Tri-County Regional Planning Commission and Info Geographics "Wellhead Protection Viewer" Program (November 9th, 2010)

City of Lansing Plugged Wells Since 2005



4



Legend

- Plugged Wells since 2005
- Roads
- +— Rail Roads
- City of Lansing

Source: Tri-County Regional Planning Commission and Info Geographics "Wellhead Protection Viewer" Program (November 9th, 2010)

Findings and Recommendations for
LANSING CHARTER TOWNSHIP

Master Plan

Findings for Lansing Township indicate **6 of 9** outcomes have been met. For further improvement, the community can:

- Define WHPAs using local, state, or federal definitions
- Acknowledge the relationship between future land use change and groundwater

Zoning Ordinance

Findings for Lansing Township indicate **6 of 8** outcomes have been met. For further improvement, the community can:

- Amend zoning ordinance to set limits for volumes of on-site storage of fuel and other potential contaminants

Site Plan Review

Findings for Lansing Township indicate **10 of 12** outcomes have been met. For further improvement, the community can:

- If floor drains are permitted, require that they be connected to subsurface wastewater disposal systems
- Include specific provisions for the on-site handling, storage, use, and manufacture of chemicals that explicitly states that “the storage of fuels, chemicals, and other hazardous substances will be stored in a location with an impervious floor that lacks floor drains”

General Recommendations

Findings from an interview with Matt Brinkley indicate **8 of 11** satisfactory responses. For further improvement, the community can:

- Set standards for when a Phase I Environmental Site Assessments are required; make these a requirement for any new development in WHPAs.
- Develop assistance programs (financial and/or technical) for locating and plugging abandoned wells
- Ensure that new regulations concerning wellhead and groundwater issues are thoroughly reviewed by the regional planning authority
- Update Contingency Plans
Emergency response is imperative for the prevention of serious contamination issues. Without adequate plans to deal with these situations, detrimental effects can come to ground water and wellhead protection areas. Also, clean up can become increasingly more expensive as time goes on. Fire response must have knowledge of locations with hazardous material in order to handle the emergency

correctly. Improper fire control can cause contamination to runoff into groundwater and potentially pollute drinking water. Furthermore, outside externalities, such as a railway spill, must be cleaned promptly and efficiently to ensure the wellbeing of groundwater and wellhead protection areas.

- **Maintain Current Data on Groundwater**

Current and regularly updated groundwater information is important in the maintenance of the community's water quality and usage. Without regular ground water monitoring, issues can arise that would have a much greater impact than if acknowledged early on. Low water levels require a particular response, and without proactive knowledge of this, a well could dry up unnoticed. Furthermore, contamination that is found early will greatly decrease the impact it has on surrounding areas. It is important to maintain these practices of regular upkeep of groundwater data to be knowledgeable of arising issues.

- **Encourage Best Management Practices**

This can be done through media campaigns, public awareness and education programs, as well as by word of mouth. Best management practices are important for mitigation and prevention of potentially hazardous and costly environmental risks. In this case drinking water is at risk of contamination. Local officials can encourage best management practices to assist with preventative wellhead protection planning.

Wellhead and Groundwater Protection Audit Tool: Lansing Charter Township

Master Plan

This section is to be completed by relying on the community's master plan document (Charter Township of Lansing: Master Plan 2009-2039) as well as any supplementary adopted plans. This section is broken into two parts with specific questions for: wellhead protection and groundwater protection. This is done in order to make direct wellhead protection planning clear. The groundwater specific part includes additional questions related to protecting groundwater resources which have an effect on wellheads. These two categories complement each other and help create a more comprehensive overview. Each question is to be answered with citations as to where the information is found in the legal documents to ensure quick access for reference.

Wellhead Protection

Question	Response
1) Are the wellhead protection areas (WHPAs) included in the plan?	Yes, pg. 59: Map 13: Lansing Township Contaminated Sites
2) Are WHPAs defined?	Not explicitly, pg. 56: "Wellhead protection areas have been established to protect groundwater resources from pollution".
3) Does the community utilize overlay zones for WHPAs?	No
4) Is there reference to designated Brownfield sites located within WHPAs?	Yes, pg. 56: Other Brownfields, "Of particular concern are contaminated sites located within wellhead protection area."

Groundwater Protection

Question	Response
5) In the goals and objectives section of the master plan, is the protection of groundwater an issue of importance for the community?	Yes, pg.13: Goal: Environmental Stewardship, Objective: 3.) "Continue to participate in and support regional efforts to improve ground and surface water quality". Also, in another section (not goals and objectives) titled Natural Resources and Environment: p. 56-57, "As a community which depends on groundwater for almost all of its drinking water, protecting this vital resource is very important".
6) <i>Follow-up:</i> If yes, is the community's strategy for protection noted?	Yes, pg.13: "Continue to participate in and support regional efforts to improve ground and surface water quality".
7) Does the plan evaluate and take into account impacts of future land use changes on groundwater?	No, only "surface bodies of water".
8) Does the plan acknowledge the need for a regional effort for groundwater protection?	Yes, pg.13: Goal, Environmental Stewardship, Objective: 3.) "Continue to participate in and support regional efforts to improve ground and surface water quality"; p. 58, Conclusions, Water Resource Management, "Lansing Township has been very active in regional water quality protection efforts. Long range plans should be developed that reflect this commitment and directly address stormwater management and wellhead protection through the formulation of policy and continued collaboration with other communities and regional partners." Also, p. 81, Implementation, Policy Response: "Continue to actively participate in regional environmental initiatives including the Greater Lansing Regional Committee (GLRC) and Groundwater Management, 3-5 Years".
9) Are specific sites with existing or perceived sources of contamination identified in the plan?	Yes, pg. 59: Map 13: Lansing Township Contaminated Sites: Leaking Underground Storage Tanks, and Leaking Underground Storage Tank in WHPAs are delineated. Also, pg. 56: GM site and Fly-ash Sites are discussed as contamination areas.

Zoning Ordinance

This section is to be completed by relying on the community's zoning ordinance and site plan review documents (Charter Township of Lansing, Michigan. Codified through Ordinance No. 71.1, adopted September 14, 2010. (Supplement No. 11)). This section is broken into two parts: general zoning ordinance questions and site plan review assessment. The site plan review is usually located within the zoning ordinance, which is why they are organized accordingly. The general zoning ordinance section is further broken down into questions pertaining to wellhead protection and groundwater protection separately. This is again done in order to make a distinction between wellhead protection planning and the topic of overall groundwater protection planning. The site plan review assessment contains questions specific to new development procedures or land use changes. Each question is to be answered with citations as to where the information is found in the legal documents to ensure quick access for reference.

Wellhead Protection

<u>Question</u>	<u>Response</u>
10) Does the WHPA encompass any districts zoned for medium or heavy industrial uses?	Yes, based on a comparison of zoning maps and WHPA maps.
11) Are abandoned water wells, abandoned monitoring wells and cisterns plugged in accordance with regulations and procedures of the Michigan Department of Environmental Quality as well as the county health department?	Yes, not explicitly from the MDEQ, but implied chapter 85-10.4: 23.)"Abandoned water wells (wells that are no longer in use or are in disrepair), abandoned monitoring wells, and cisterns shall be plugged in accordance with regulations and procedures of appropriate local, state, and federal agencies".
12) Do any of the community's ordinances contain regulations on the withdrawal of groundwater (volumes or rates) from industrial/commercial wells?	No
13) Does the zoning ordinance include the definitions of materials deemed to be 'hazardous substances'?	Yes, chapter 24-1: (1) "Hazardous substance/waste includes one or more of the following: a. Hazardous substance as defined by the United States Comprehensive Environmental Response Compensation and Liability Act (CERCLA); b. Any substance designated pursuant to section 311(B)(2)(A) of the Federal Water Pollution Control Act; c. Any element, compound, mixture, solution, or substance designated pursuant to section 102 of CERCLA; d. Any hazardous waste having characteristics identified under or listed pursuant to section 3001 of the Solid Waste Disposal Act (not including waste regulations suspended by act of Congress); e. Any toxic pollutant listed under section 307(a) of the Federal Water Pollution Control Act; f. Any hazardous air pollutant listed under section 112 of the Clean Air Act; g. Any hazardous chemical substance or mixture with respect to which the administrator has taken action pursuant to section 7 of the Toxic Substance Control Act; h. Petroleum as described in part 213 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (MCL 324.11101, et seq.) ("NREPA"); i. Any substance that the Michigan Department of Environmental Quality or a successor agency of the state demonstrates, on a case-by-case basis, poses an unacceptable risk to the public health, safety, or welfare, or the environment, considering the fate of the material, dose-response, toxicity, or adverse impact on natural resources; and/or j. Hazardous waste as defined in part 111 of NREPA".
14) Are above ground storage tanks certified, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality? <i>(Source: Mark Wyckoff Recommendations for Tri-County Communities on WHP Regulations, 2000)</i>	Yes, chapter 85-10-4: 21.)"Above-ground storage tanks shall be certified, installed, operated, maintained, closed or removed in accordance with regulations of appropriate local, state, and federal agencies".

<p>15) Are underground storage tanks registered, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality?</p> <p><i>(Source: Mark Wyckoff, Recommendations for Tri-County Communities on WHP Regulations, 2000)</i></p>	<p>Yes, chapter 85-10-4: 20.) "Underground storage tanks shall be registered, installed, operated, maintained, closed or removed in accordance with regulations of appropriate local, state, and federal agencies".</p>
<p>16) Are local regulations present that require bulk storage facilities which house pesticides and fertilizers to be in compliance with Michigan Department of Agriculture requirements?</p> <p><i>(Source: Mark Wyckoff, Recommendations for Tri-County Communities on WHP Regulations, 2000)</i></p>	<p>Yes, chapter 85-10.4: 22.) "Bulk storage facilities for pesticides and fertilizers shall be in compliance with requirements of appropriate local, state, and federal agencies".</p>
<p>17) Does the zoning ordinance set limits on the volume of fuels able to be stored on-site for land uses other than designated fuel storage areas?</p>	<p>No</p>
<p>18) Are there any provisions in the zoning ordinance for the demolition of buildings that include the management of wells as a standard?</p>	<p>Yes, chapter 109 -6: "Demolition plan for class 1 demolition projects. (G) The location of functional and/or abandoned public water mains, public and private drinking water wells, monitoring wells, irrigation wells, test wells, or wells used for industrial purposes", "(6) Plans for the removal of underground drains, water lines and/or mains, sewer lines, pipes, and wells"; chapter 109-7: "3.) A site plan or other acceptable diagram of the entire property and adjacent properties that clearly depicts: (H) The location of functional and/or abandoned public water mains, public and private drinking water wells, monitoring wells, irrigation wells, test wells, or wells used for industrial purposes", "(K) The location of the property with respect to a wellhead protection area, if applicable"; chapter 109-7 "(13) Plans for the removal of underground drains, water lines and/or mains, sewer lines, pipes, and wells. chapter 109-10 "Standards for demolition permit approval for class 1 demolition projects.; A Demolition Permit shall be approved and granted by Township Staff for a Class 1 Demolition Project if the Demolition Permit Application and Demolition Plan are determined to comply with the following standards: (5) The demolition plan provides adequate plans for the removal, if necessary, of all underground drains, water lines and/or mains, sewer lines, pipes, and wells related to buildings and structures that are subject to demolition activities"; chapter 109-11 "Standards for demolition permit approval for class 2 demolition projects and class 3 demolition projects (4) The demolition plan provides for the removal of all underground drains, water lines and/or mains, sewer lines, pipes, and wells related to buildings and structures that are subject to demolition activities".</p>

Groundwater Protection

<u>Question</u>	<u>Response</u>
<p>19) Are provisions present that explicitly state that no discharge to surface water or groundwater, including direct and indirect discharges of waste, waste effluent, wastewater, pollutants, or cooling water, shall be allowed without approval from appropriate state, county and local agencies?</p> <p><i>(Source: Mark Wyckoff, Recommendations for Tri-County Communities on WHP Regulations, 2000)</i></p>	<p>Yes, chapter 85-10.4: 24). "State and federal requirements for storage, spill prevention, recordkeeping, emergency response, transport and disposal of hazardous substances, hazardous wastes, liquid industrial waste or potentially polluting materials shall be met. No discharge to surface water or groundwater, including direct and indirect discharges of waste, waste effluent, wastewater, pollutants, or cooling water, shall be allowed without approval from appropriate state, county and local agencies".</p>
<p>20) Does the zoning ordinance contain provisions for the protection of areas with a high potential for groundwater recharge?</p>	<p>Yes, chapter 85-10: "2.) <i>Administrative review.</i> A site plan may be reviewed and approved by the zoning administrator, without further review by the planning commission and approval from the township board, if the following requirements are satisfied: (g.) Any earth change activity, including construction of new buildings and structures and additions to existing buildings and structures, does not directly affect a surface body of water, wetland, or other natural water feature regulated by part 301 or 303 of P.A. 451 of 1994 the Natural Resources and Environmental Protection Act"; chapter 85-10.4: "16.) The project and related improvements shall be designed to protect land and water resources from pollution, including pollution of soils, groundwater, rivers, streams, lakes, ponds, and wetlands"; chapter 85-10.4 "18.) Sites at which hazardous substances, hazardous wastes, or potentially polluting materials are stored, used, or generated shall be designed to prevent spills and discharges of such materials to the air, surface of the ground, groundwater, lakes, streams, rivers or wetlands"; chapter 109-6. "Demolition plan for class 1 demolition projects. Each demolition permit application for a class 1 demolition project shall be accompanied by a demolition plan that contains the following information, data and documentation:(H) The location on the property of existing water courses and water bodies, including county drains and manmade surface drainageways, floodplains, and wetlands"; chapter 109-7. "Demolition plan for class 2 demolition projects and class 3 demolition projects. (3) A site plan or other acceptable diagram of the entire property and adjacent properties that clearly depicts: (H) The location of functional and/or abandoned public water mains, public and private drinking water wells, monitoring wells, irrigation wells, test wells, or wells used for industrial purposes. (I) The location on the property, and adjacent property within 500 feet of the property, of existing water courses and water bodies, including county drains and manmade surface drainageways, floodplains, and wetlands".</p>

Site Plan Review Assessment

<u>Question</u>	<u>Response</u>
<p>21) Please indicate which of the following conditions/requirements are present for approval of site plans:</p>	
<p>➤ Existing topographic elevations at two (2) foot contour intervals. Indicate direction of drainage flow.</p>	<p>Yes, chapter 85-11.5: 3.) j. "Existing and proposed topographical contours at a minimum of two foot intervals".</p>
<p>➤ The location and elevations of existing water courses and water bodies, including county drains and manmade surface drainageways, floodplains, and wetlands.</p>	<p>Yes, chapter 85-10.1: 11.) "Location and elevations of existing water courses and water bodies, including county drains and manmade surface drainageways, floodplains, and wetlands."</p>

<p>➤ Location for on-site wastewater treatment and disposal systems.</p>	<p>Yes, chapter 85-10.1: 9.) "Proposed utilities and services and tentative locations, including dumpsters, and the locations for on-site wastewater treatment and disposal systems".</p>
<p>➤ Location of existing and proposed public and private drinking water wells, monitoring wells, irrigation wells, test wells or wells used for industrial processes.</p>	<p>Yes, chapter 85-10.1: 10.) "Location of existing and proposed public water mains, public and private drinking water wells, monitoring wells, irrigation wells, test wells or wells used for industrial processes".</p>
<p>➤ Description and location for any existing or proposed above ground and below ground storage facilities.</p>	<p>Yes, chapter 85-10.4: 19.) "Secondary containment facilities shall be provided for above-ground storage of hazardous substances, hazardous wastes, or potentially polluting materials in accordance with state and federal requirements. Above-ground secondary containment facilities shall be designed and constructed so that the potentially polluting material cannot escape from the unit by gravity through sewers, drains, or other means, directly or indirectly into a sewer system, or to the waters of the state (including groundwater) 20.) Underground storage tanks shall be registered, installed, operated, maintained, closed or removed in accordance with regulations of appropriate local, state, and federal agencies. 21.) Above-ground storage tanks shall be certified, installed, operated, maintained, closed or removed in accordance with regulations of appropriate local, state, and federal agencies."</p>
<p>➤ <i>If floor drains are permitted:</i> The location and status of any floor drains in existing or proposed structures on the site. The point of discharge for all drains and pipes shall be specified on the site plan.</p>	<p>Yes, chapter 85-10.1: 20.) "Location and status of any floor drains in existing or proposed structures on the site. Further, the point of discharge for all drains and pipes shall be specified on the site plan".</p>
<p>➤ <i>If floor drains are permitted:</i> Is it a requirement that they be connected to subsurface wastewater disposal systems?</p>	<p>No</p>
<p>➤ Inventory of hazardous substances to be stored, used or generated on-site, presented in a format acceptable to the local fire marshal (include Chemical Abstracts Service (CAS) numbers).</p>	<p>Yes, chapter 85-10.1: 22.) c. "Inventory of hazardous substances to be stored, used or generated on-site, presented in a format acceptable to the township fire marshal (include CAS numbers)."</p>
<p>➤ Descriptions of type of operations proposed for the project and drawings showing size, location, and description of any proposed interior or exterior areas of structures for storing, using, loading or unloading of hazardous substances, hazardous wastes, and/or polluting materials.</p>	<p>Yes, chapter 85-10.1: 22.) d. "Descriptions of type of operations proposed for the project and drawings showing size, location, and description of any proposed interior or exterior areas of structure for storing, using, loading or unloading of hazardous substances, hazardous wastes, and/or polluting materials."</p>
<p>➤ Completion of the Environmental Permits Checklist on the form provided by the Zoning Administrator.</p>	<p>Yes, chapter 85-10.1: 22.) e. "Completed environmental permits checklist on the form provided by the Zoning- Administrator".</p>
<p>➤ Does the zoning ordinance contain specific provisions for the on-site handling, storage, use, and manufacture of chemicals?</p>	<p>Yes, chapter 85-8: 3.) a. Bulk storage of flammable liquids, liquid petroleum, gases and explosives; provided, all tanks shall be below ground and located not less than 100 feet from property lines, and the storage and handling shall comply with state rules and regulations.</p>
<p>➤ If yes to the previous question, does the zoning ordinance explicitly state that the storage of fuels, chemicals, and other hazardous substances will be stored in a location with an impervious floor that lacks floor drains?</p>	<p>No</p>

Interview Questions

This section is to be completed by relying on the community's representatives that are responsible for wellhead and groundwater protection. A combination of the following may be necessary to complete this section, examples of appropriate persons include: planners, engineers, public works officials, and health department representatives. These persons should have access to specific information pertinent to the municipality. Some of the questions listed in this audit tool are specific to mid-Michigan and this particular area. The interview part is divided into three sections: procedural and enforcement, education and outreach, and information sharing and data management. Each of these sections is then broken into specific questions for: wellhead protection and groundwater protection. The answers to these questions will help provide a basis for analyzing wellhead and groundwater protection planning. It is important to note who was interviewed, as well as the date to ensure proper reference.

Interview Subject: *Matthew Brinkley, AICP (Senior Planner at Lansing Township)*

Date/Time: *March 15th, 2011, 11:00AM*

Location: *Union Building, Michigan State University*

Procedural & Enforcement

Wellhead Protection

<u>Question</u>	<u>Response</u>
22) Does the community require onsite inspections of new land uses in WHPAs?	Yes, however these inspections are required whether or not the use is located in a WHPA.
23) How often are plugged wells inspected?	Ingham County Community Health Department is responsible for this, but inspections for capped wells are rarely completed.
24) Is a Phase I Environmental Assessment required before starting development in a WHPA?	No
25) How often are new WHPAs assessed and integrated into maps and plans?	No new ones have been delineated, so rarely.

Groundwater Protection

<u>Question</u>	<u>Response</u>
26) Are there any difficulties with the enforceability of any groundwater regulations in the community's zoning ordinance?	Yes, mainly administratively. "There is not a strong enough process to follow; there is a lack of qualified experts". A coordinated effort is needed. In Lansing Township there is no public works department or engineering department. There is too much reliance on third parties.
27) Within the past three years, have any variances been given that affect groundwater regulations?	No
28) Does the community require potentially contaminating land uses to submit contingency plans for emergency response? Do these plans ensure protection from discharges and spills to groundwater?	Yes, this is a requirement from the state and federal entities (PIPP's submitted to EPA and MDEQ).

29) In what instances does the municipality require groundwater monitoring?	Not done by Township, Westside Water and Lansing Board of Water and Light. Lansing Board of Water and Light publishes annual water quality reports.
30) Do you have and use an environmental assessment checklist? How often is this updated?	Yes, Lansing Township utilizes the standard Ingham County Environmental Permits Checklist.

Education & Outreach

Wellhead Protection

<u>Question</u>	<u>Response</u>
31) Does the community provide incentives in reporting and plugging private abandoned wells?	No however, they require that wells are properly plugged when a property owner seeks connection to the public water supply.
32) Does the community have signs to build awareness about WHPAs?	Yes, the township has wellhead protection areas, watershed, and Greater Lansing Regional Committee for Stormwater Management (GLRC) surface water signs.

Groundwater Protection

<u>Question</u>	<u>Response</u>
33) Has the community ever engaged in a media campaign that promoted groundwater quality? If so, what kind?	Not specifically, however the township has engaged in regional campaigns.
34) Is the community actively involved in the Children's Water Festival?	Yes

Information Sharing & Data Management

Wellhead Protection

<u>Question</u>	<u>Response</u>
35) When a community delineates a new wellhead protection area, is the information shared with other communities within the 10-year time of travel?	No new ones have been delineated (not since USGS delineations of 2005). However, if they were or when they are, it will be shared.
36) Have any new public wells been drilled in the community since 2005, when the latest delineations occurred?	No

Groundwater Protection

<u>Question</u>	<u>Response</u>
37) Are local groundwater regulations reviewed by a regional authority prior to implementation? Are their standards met?	No new standards, but the township works closely with the Groundwater Management Board and Greater Lansing Regional Committee (for Stormwater Management) (GLRC) for regulations.

38) To whom are questions directed when the community's zoning administrator or planning staff is in need expert or technical assistance when a question related to groundwater is unknown?	Tri-County Regional Planning Commission
39) How is your community represented on the Groundwater Management Board?	The Director of Westside Water sits on the board.
40) Does your community maintain basic data GIS data on wells and WHPA's?	Yes, the wellhead protection area layer.
41) What is the local department that is primarily responsible for mapping and GIS? Is this data shared with regional and state entities as updates become available?	Planning department, information is shared as updates become available.

SWOT Analysis

Based on a community's internal (the answers provided from the question-and-answer portion of the audit) and external (demography and geography) factors, an analysis of strengths, weaknesses, opportunities, and threats (SWOT) has been created. This SWOT analysis aids in the identification of barriers and gauge the community's potential room for improvement.

Strengths

- Information shared across agencies and communities
- Strong zoning provisions on demolition effects of groundwater and wellhead; Ch. 109: "Demolition of Buildings and Structures" is considered one of the most stringent demolition ordinances in the state
- Awareness signs about WHPAs
- Master Plan 2009 Map 13: Lansing Township Contaminated Sites
- The township has used public water for a prolonged period of time and therefore has few abandoned or private wells within township limits
- All new land uses require some form of on-site inspection such as a zoning compliance inspection, building inspection, etc.
- Relationship with Westside Water on groundwater protection

Opportunities

- Expand standard Environmental Permits Checklist regularly to be more specific to the community
- Fulfill wellhead protection strategy outlined in master plan

Weaknesses

- Does not provide plugging assistance for abandoned wells
- Low level of collaboration between Lansing Township and the City of Lansing
- Lack of locally focused WHP media strategy promoting education and awareness
- Lack of data on private abandoned wells

Threats

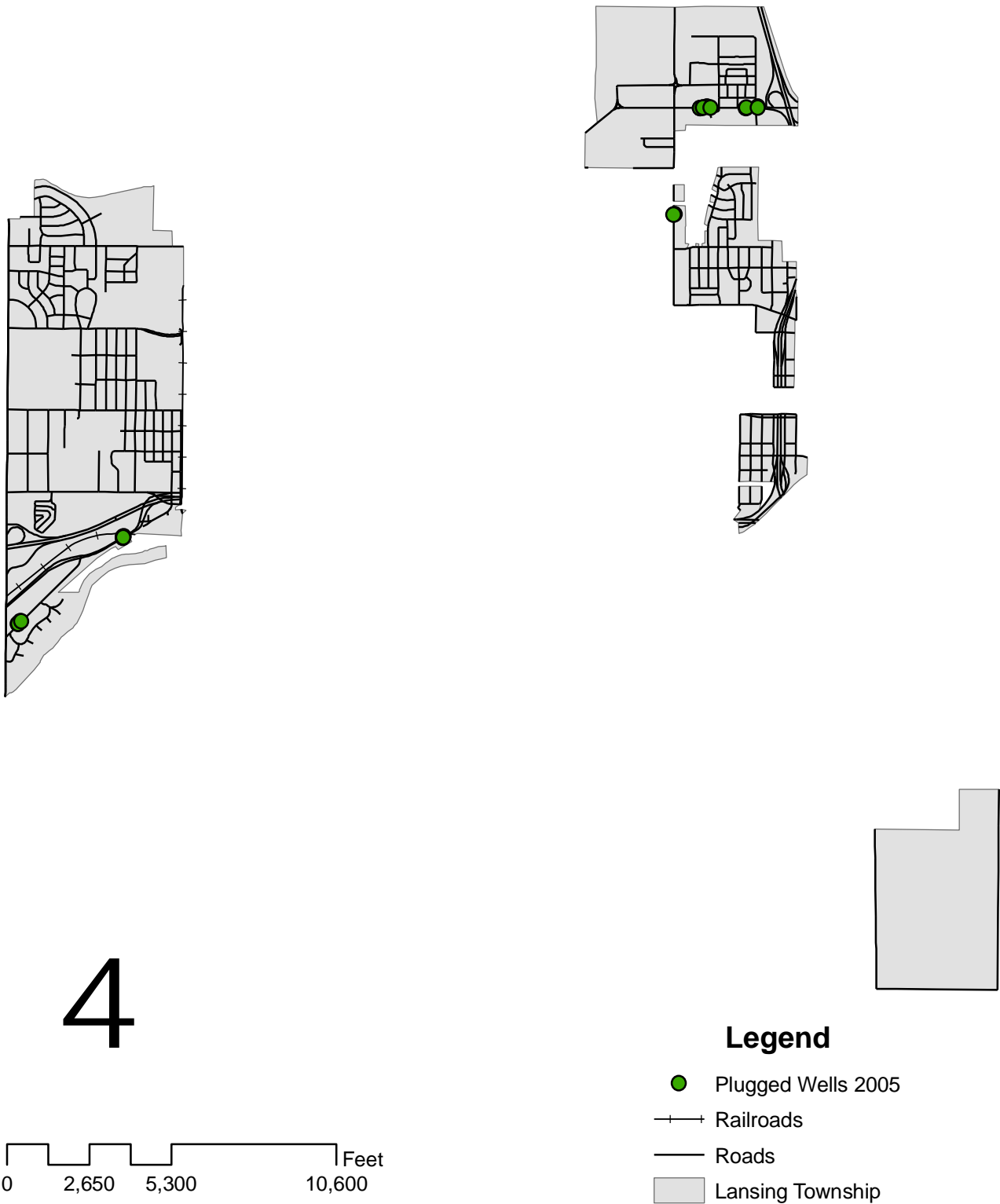
- Numerous contaminated and Superfund sites
- Industrial history
- Reduced state and federal funding threatens local wellhead protection efforts
- Insufficient regulations for floor drains allow for discharge of potentially hazardous materials
- Medium and heavy industrial zoning districts located within WHPAs

Lansing Charter Township Wells



Source: Tri-County Regional Planning Commission and Info Geographics "Wellhead Protection Viewer" Program (November 9th, 2010)

Lansing Charter Township Plugged Wells Since 2005



Source: Tri-County Regional Planning Commission and Info Geographics "Wellhead Protection Viewer" Program (November 9th, 2010)

Findings and Recommendations for
MERIDIAN CHARTER TOWNSHIP

Master Plan

Findings for Meridian Township indicate **5 of 8** outcomes have been met. For further improvement, the community can:

- Define WHPAs and reference where to find the most current WHP data and delineations
- Cite the location of existing and perceived sources of contamination as well as designated Brownfield sites located within the WHPAs

Zoning Ordinance

Findings for Meridian Township indicate **6 of 8** outcomes have been met. For further improvement, the community can:

- Amend zoning ordinance to set limits for volumes of on-site storage of fuel and other potential contaminants
- Create ordinance provisions for the demolition of buildings that ensure the safeguarding of wells

Site Plan Review

Findings for Meridian Township indicate **11 of 12** outcomes have been met. For further improvement, the community can:

- Include specific provisions for the on-site handling, storage, use, and manufacture of chemicals that explicitly states that “the storage of fuels, chemicals, and other hazardous substances will be stored in a location with an impervious floor that lacks floor drains”.

General Recommendations

Findings from an interview with Rick Brown indicate **8 of 11** satisfactory responses. For further improvement, the community can:

- Develop assistance programs (financial and/or technical) for locating and plugging abandoned wells
- Develop an awareness program for WHPAs that includes signage
- Set standards for when a Phase I Environmental Site Assessments is required; make these a requirement for any new development in WHPAs
- Update Contingency Plans
Emergency response is imperative for the prevention of serious contamination issues. Without adequate plans to deal with these situations, detrimental effects can come to ground water and wellhead protection areas. Also, clean up can become increasingly more expensive as time goes on. Fire response must have knowledge of locations with hazardous material in order to handle the emergency correctly. Improper fire control can cause contamination to runoff into groundwater and potentially pollute drinking water. Furthermore, outside

externalities, such as a railway spill, must be cleaned promptly and efficiently to ensure the wellbeing of groundwater and wellhead protection areas.

- **Maintain Current Data on Groundwater**

Current and regularly updated groundwater information is important in the maintenance of the community's water quality and usage. Without regular groundwater monitoring, issues can arise that would have a much greater impact than if acknowledged early on. Low water levels require a particular response, and without proactive knowledge of this, a well could dry up unnoticed. Furthermore, contamination that is found early will greatly decrease the impact it has on surrounding areas. It is important to maintain these practices of regular upkeep of groundwater data to be knowledgeable of arising issues.

- **Encourage Best Management Practices**

This can be done through media campaigns, public awareness and education programs, as well as by word of mouth. Best management practices are important for mitigation and prevention of potentially hazardous and costly environmental risks. In this case drinking water is at risk of contamination. Local officials can encourage best management practices to assist with preventative wellhead protection planning.

Wellhead and Groundwater Protection Audit Tool: Meridian Charter Township

Master Plan

This section is to be completed by relying on the community's master plan document (Meridian Charter Township Master Plan 2005) as well as any supplementary adopted plans (Meridian Charter Township Greenspace Plan 2004). This section is broken into two parts with specific questions for: wellhead protection and groundwater protection. This is done in order to make direct wellhead protection planning clear. The groundwater specific part includes additional questions related to protecting groundwater resources which have an effect on wellheads. These two categories complement each other and help create a more comprehensive overview. Each question is to be answered with citations as to where the information is found in the legal documents to ensure quick access for reference.

Wellhead Protection

Question	Response
1) Are the wellhead protection areas (WHPA) included in the plan?	No; however, WHPAs are present in the Meridian Township Greenspace Plan: Appendix, Final Report (pg. 9)
2) Are WHPAs defined?	Yes, The wellhead protection area is defined by the State of Michigan as "the surface and subsurface areas surrounding a water well, or well field, which supplies a public water system, and through which contaminants are reasonably likely to move toward and reach the water well, or well field within a 10-year time of travel."
3) Does the community utilize overlay zones for WHPAs?	No overlay zones are present for WHPAs; however, at one time Meridian attempted to use overlay zoning for groundwater recharge areas. chapter 2, pg. 14
4) Is there reference to designated Brownfield sites located within WHPAs?	No

Groundwater Protection

Question	Response
5) In the goals and objectives section of the master plan, is the protection of groundwater an issue of importance for the community?	Yes, chapter 2, pg.14: "Objective D: Protect groundwater recharge areas in the Township."
6) <i>Follow-up:</i> If yes, is the community's strategy for protection noted?	Yes, chapter 2, pg. 14: "Strategies: 1. Conduct a study to identify all important groundwater recharge areas. 2. Encourage the development of programs to educate citizens about the importance of protecting groundwater recharge areas. 3. Develop a set of public policies to protect the important groundwater recharge areas through zoning and other appropriate land management techniques."
7) Does the plan evaluate and take into account impacts of future land use changes on groundwater?	Not explicitly stated, but implied

8) Does the plan acknowledge the need for a regional effort for groundwater protection?	Yes, chapter 7, pg. 101: “Meridian Township is a member of the Groundwater Management Board (GMB) which is made up of 12 communities and Michigan State University. The purpose of the GMB is to protect the region’s drinking water resources. Potential sources of groundwater contamination are often identified during site plan review conducted by Township departments including Community Planning, Engineering and Fire. Following approval of the East Lansing/Meridian Wellhead Protection Plan, groundwater protection regulations were incorporated into the site plan review section of the zoning ordinance.”
9) Are specific sites with existing or perceived sources of contamination identified in the plan?	No

Zoning Ordinance

This section is to be completed by relying on the community’s zoning ordinance and site plan review documents (Code of Ordinances: Charter Township of Meridian, Michigan. Codified through Ordinance No. 2009-10, effective November 22, 2009. (Supplement No. 8, Rev. 2)). This section is broken into two parts: general zoning ordinance questions and site plan review assessment. The site plan review is usually located within the zoning ordinance, which is why they are organized accordingly. The general zoning ordinance section is further broken down into questions pertaining to wellhead protection and groundwater protection separately. This is again done in order to make a distinction between wellhead protection planning and the topic of overall groundwater protection planning. The site plan review assessment contains questions specific to new development procedures or land use changes. Each question is to be answered with citations as to where the information is found in the legal documents to ensure quick access for reference.

Wellhead Protection

<u>Question</u>	<u>Response</u>
10) Does the WHPA encompass any districts zoned for medium or heavy industrial uses?	No
11) Are abandoned water wells, abandoned monitoring wells, and cisterns plugged in accordance with regulations and procedures of the Michigan Department of Environmental Quality as well as the county health department? <i>(Source: Mark Wyckoff Recommendations for Tri-County Communities on WHP Regulations, 2000)</i>	Yes, pg. 78-63 (c); 86-156 (2) (b) (viii): “At such time as use of private water system, including wells, storage tanks, and similar private facilities, shall be abandoned for water supply purposes, suitable steps shall be taken to ensure that injury to persons shall not result from such abandoned, private system.” “State and federal requirements for storage, spill prevention, record keeping, emergency response, and transport and disposal of hazardous substances, hazardous wastes, liquid industrial waste, or potentially polluting materials shall be met. No discharge to surface water or groundwater, including direct and indirect discharges of waste, waste effluent, wastewater, pollutants, or cooling water, shall be allowed without approval from appropriate state, county and local agencies.”
12) Do any of the community’s ordinances contain regulations on the withdrawal of groundwater (volumes or rates) from industrial/commercial wells?	Only as much as needed, pg. 78-92: “Rates sufficient to provide for the payment of the expenses of administration and operation of the water system and such expenses for the maintenance thereof as may be necessary to preserve the same in good repair and working order; to provide for the payment of the interest upon and principal of all bonds payable there from, as and when the same shall become due and payable, and for the creation of a reserve for the payment of principal and interest required in township Ordinance No. 34; The methodology of adjusting the commodity charges shall be in accordance with the water and wastewater rate study prepared by the township's consultant. Such revisions shall be by resolution of the township board and formal amendment of township Ordinance No. 34 setting rates for water consumption shall not be necessary. All rate changes shall be published at least twice in a newspaper of general circulation within the township.”

<p>13) Does the zoning ordinance include the definitions of materials deemed to be 'hazardous substances'?</p>	<p>Yes, pg. 22-26: "Hazardous material means explosives, pyrotechnics, flammable compressed gases, flammable liquids, combustible liquids, oxidizing materials, poisonous gases, poisonous liquids, poisonous solids, irritating materials, etiological materials, radioactive materials, corrosive materials, or liquefied petroleum gases."</p>
<p>14) Are above ground storage tanks certified, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality?</p> <p><i>(Source: Mark Wyckoff Recommendations for Tri-County Communities on WHP Regulations, 2000)</i></p>	<p>Yes, pg. 86-156 (2) (b) (v): "Aboveground storage tanks shall be certified, installed, operated, maintained, closed, or removed in accordance with regulations of the state department of environmental quality"</p>
<p>15) Are underground storage tanks registered, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality?</p> <p><i>(Source: Mark Wyckoff, Recommendations for Tri-County Communities on WHP Regulations, 2000)</i></p>	<p>Yes, pg. 293- 5 (v): "Aboveground storage tanks shall be certified, installed, operated, maintained, closed, or removed in accordance with regulations of the state department of environmental quality."</p>
<p>16) Are local regulations present that require bulk storage facilities which house pesticides and fertilizers to be in compliance with Michigan Department of Agriculture requirements?</p> <p><i>(Source: Mark Wyckoff, Recommendations for Tri-County Communities on WHP Regulations, 2000)</i></p>	<p>Yes, pg. 293-5 (vi): "Bulk storage facilities for pesticides and fertilizers shall be in compliance with requirements of the state department of agriculture."</p>
<p>17) Does the zoning ordinance set limits on the volume of fuels able to be stored on-site for land uses other than designated fuel storage areas?</p>	<p>No</p>
<p>18) Are there any provisions in the zoning ordinance for the demolition of buildings that include the management of wells as a standard?</p>	<p>No</p>

Groundwater Protection

<u>Question</u>	<u>Response</u>
<p>19) Are provisions present that explicitly state that no discharge to surface water or groundwater, including direct and indirect discharges of waste, waste effluent, wastewater, pollutants, or cooling water, shall be allowed without approval from appropriate state, county and local agencies?</p> <p><i>(Source: Mark Wyckoff, Recommendations for Tri-County Communities on WHP Regulations, 2000)</i></p>	<p>Yes, pg. 293-5 (viii): “State and federal requirements for storage, spill prevention, record keeping, emergency response, and transport and disposal of hazardous substances, hazardous wastes, liquid industrial waste, or potentially polluting materials shall be met. No discharge to surface water or groundwater, including direct and indirect discharges of waste, waste effluent, wastewater, pollutants, or cooling water, shall be allowed without approval from appropriate state, county and local agencies.”</p>
<p>20) Does the zoning ordinance contain provisions for the protection of areas with a high potential for groundwater recharge?</p>	<p>Yes, pg. 62-65 and all of section 22: “Dumping or backfilling with any material in any manner. In the case where floodway fringe areas have no groundwater recharge or impoundment potential, filling may occur through compensating excavation and shaping of floodway fringe in such a way as to maintain or improve the flow or natural impoundment capacity of the floodway fringe. In no case shall the flow or impoundment capacity of the floodway fringe be reduced.”</p>

Site Plan Review Assessment

<u>Question</u>	<u>Response</u>
<p>21) Please indicate which of the following conditions/requirements are present for approval of site plans:</p>	
<p>➤ Existing topographic elevations at two (2) foot contour intervals. Indicate direction of drainage flow.</p>	<p>Yes, pg. 86-154-8: “Utility plan, drawn to scale, showing the location and size of existing and proposed public water mains, wells, and sanitary sewers and associated easement or location of existing and proposed private drinking water wells, on-site wastewater treatment and disposal systems. The location of existing and proposed monitoring wells, irrigation wells, test wells, or wells used for industrial processes shall also be depicted. The location of existing and proposed private utilities including natural gas, electricity, telephone, and cable television and associated easements shall also be shown on the plan.”</p>
<p>➤ The location and elevations of existing water courses and water bodies, including county drains and manmade surface drainageways, floodplains, and wetlands.</p>	<p>Yes, pg. 86-154: “The location and status of any floor drains in existing or proposed structures on the site. The point of discharge for all drains and pipes shall be specified on the site plan.”</p>
<p>➤ Location for on-site wastewater treatment and disposal systems.</p>	<p>Yes, pg. 86-154-8: “The location of existing and proposed monitoring wells, irrigation wells, test wells, or wells used for industrial processes shall also be depicted. The location of existing and proposed private utilities including natural gas, electricity, telephone, and cable television and associated easements shall also be shown on the plan.”</p>
<p>➤ Location of existing and proposed public and private drinking water wells, monitoring wells, irrigation wells, test wells or wells used for industrial processes.</p>	<p>Yes, pg. 86-154-8: “The location of existing and proposed monitoring wells, irrigation wells, test wells, or wells used for industrial processes shall also be depicted. The location of existing and proposed private utilities including natural gas, electricity, telephone, and cable television and associated easements shall also be shown on the plan.”</p>

<p>➤ Description and location for any existing or proposed above ground and below ground storage facilities.</p>	<p>Yes, pg. 86-154-14: “A description and location for any existing or proposed above ground and below ground storage facilities.”</p>
<p>➤ <i>If floor drains are permitted:</i> The location and status of any floor drains in existing or proposed structures on the site. The point of discharge for all drains and pipes shall be specified on the site plan.</p>	<p>Yes, pg. 86-154-13 and pg. 86-156-2: “The location and status of any floor drains in existing or proposed structures on the site. The point of discharge for all drains and pipes shall be specified on the site plan.” “General purpose floor drains shall be connected to a public sewer system or an on-site holding tank (not a septic system) in accordance with state, county, and municipal requirements, unless a groundwater discharge permit has been obtained from the state department of environmental quality. General purpose floor drains which discharge to groundwater are generally prohibited.”</p>
<p>➤ <i>If floor drains are permitted:</i> Is it a requirement that they be connected to subsurface wastewater disposal systems?</p>	<p>Yes, Site Plan Review, pg. 86-156-5 (i): “General purpose floor drains shall be connected to a public sewer system or an on-site holding tank (not a septic system) in accordance with state, county, and municipal requirements, unless a groundwater discharge permit has been obtained from the state department of environmental quality. General purpose floor drains which discharge to groundwater are generally prohibited.”</p>
<p>➤ Inventory of hazardous substances to be stored, used or generated on-site, presented in a format acceptable to the local fire marshal (include Chemical Abstracts Service (CAS) numbers).</p>	<p>Yes, pg. 86-5-9 and pg. 86-154-16: “The description of the type of operations proposed for the project and drawings showing size, location, and description of any proposed interior or exterior areas for the storing, using, loading or unloading of hazardous substances, hazardous wastes, and/or polluting materials.”</p>
<p>➤ Descriptions of type of operations proposed for the project and drawings showing size, location, and description of any proposed interior or exterior areas of structures for storing, using, loading or unloading of hazardous substances, hazardous wastes, and/or polluting materials.</p>	<p>Yes, pg. 86-5-9, 86-154-16, and 86-156-2b-5: “Secondary containment facilities shall be provided for aboveground storage of hazardous substances, hazardous wastes, or potentially polluting materials in accordance with state and federal requirements. Aboveground secondary containment facilities shall be designed and constructed so that the potentially polluting material cannot escape from the unit by gravity through sewers, drains, or other means, directly or indirectly, into a sewer system or to the waters of the state, including groundwater. ”</p>
<p>➤ Completion of the Environmental Permits Checklist on the form provided by the Zoning Administrator.</p>	<p>Yes, pg. 86-154-18: “Completion of the environmental permits checklist on the form provided by the department of community planning and development.”</p>
<p>➤ Does the zoning ordinance contain specific provisions for the on-site handling, storage, use, and manufacture of chemicals?</p>	<p>Yes, pg. 86-402: “Application of organic or synthetic pesticides, fertilizers, or other chemicals shall not be permitted in the natural vegetation strip.”</p>
<p>➤ If yes to the previous question, does the zoning ordinance explicitly state that the storage of fuels, chemicals, and other hazardous substances will be stored in a location with an impervious floor that lacks floor drains?</p>	<p>No</p>

Interview Questions

This section is to be completed by relying on the community's representatives that are responsible for wellhead and groundwater protection. A combination of the following may be necessary to complete this section, examples of appropriate persons include: planners, engineers, public works officials, and health department representatives. These persons should have access to specific information pertinent to the municipality. Some of the questions listed in this audit tool are specific to mid-Michigan and this particular area. The interview part is divided into three sections: procedural and enforcement, education and outreach, and information sharing and data management. Each of these sections is then broken into specific questions for: wellhead protection and groundwater protection. The answers to these questions will help provide a basis for analyzing wellhead and groundwater protection planning. It is important to note who was interviewed, as well as the date to ensure proper reference.

Interview Subject: Rick Brown, AICP (Associate Planner at Meridian Township)

Date/Time: February 23^d, 2011 10:00AM

Location: Meridian Township Municipal Building

Procedural & Enforcement

Wellhead Protection

Question	Response
22) Does the community require onsite inspections of new land uses in WHPAs?	On-site inspections are required for two aspects of the development; the first is the building and its interior which is conducted by the building inspector. Anything elements outside of the building is subject to a comprehensive site inspection by Meridian Township's landscape architect.
23) How often are plugged wells inspected?	Plugged wells are not inspected by Meridian Township.
24) Is a Phase I Environmental Assessment required before starting development in a WHPA?	Phase I Environmental Site Assessments (ESA) are not explicitly required for development within WHPAs unless pre-existing contamination is known or perceived, or in some cases, may be listed as a condition if the applicant is seeking a special use permit. Additionally, a lender may require a Phase I ESA if they feel it is necessary.
25) How often are new WHPAs assessed and integrated into maps and plans?	WHPAs are typically assessed and integrated into maps and plans whenever WHPA 10-year time of travel data is made available by the USGS. Meridian's most recent well was drilled in 2000 and was incorporated into the WHPA using USGS data from 2005.

Groundwater Protection

Question	Response
26) Are there any difficulties with the enforceability of any groundwater regulations in the community's zoning ordinance?	Yes, Zoning Ordinance sets regulations for Groundwater Recharge Protection Areas; a form of overlay district. Regulations derived from these districts are unenforceable due to inconsistencies in coverage, and so are not used
27) Within the past three years, have any variances been given that affect groundwater regulations?	Mr. Brown indicated that the community had not, in recent times, issued any variances that affect groundwater regulations.
28) Does the community require potentially contaminating land uses to submit contingency plans for emergency response? Do these plans ensure protection from discharges and spills to groundwater?	The community itself does not require contingency plans for contaminating land uses; however, Pollution Incident Prevention Plans are required by the Michigan Department of Environmental Quality. Additionally, the County Health Department requires the submission of a Firefighter Right-to-Know form that describes the hazardous substances and fuels being used on site.

29) In what instances does the municipality require groundwater monitoring?	The community rarely requires groundwater monitoring, as it is typically a function of the Michigan Department of Environmental Quality. The Township may, in some cases, require monitoring wells be left installed on a site even after a redevelopment or change of use.
30) Do you have and use an environmental assessment checklist? How often is this updated?	The community has and uses an environmental checklist. This checklist was developed by Mark Wyckoff of the Planning and Zoning Center and adopted by the community in 1998. Meridian Township's environmental assessment checklist has been updated twice by the planning department since its adoption.

Education & Outreach

Wellhead Protection

<u>Question</u>	<u>Response</u>
31) Does the community provide incentives in reporting and plugging private abandoned wells?	The community does not provide financial incentives for reporting or capping abandoned wells. This is due in part to financial constraints and essential community services taking priority, though some assistance may be available from the State.
32) Does the community have signs to build awareness about WHPAs?	The community utilizes a variety of outdoor signs to identify environmentally sensitive areas such as wetlands and land preservation areas. However; these signs do not include wellhead protection areas.

Groundwater Protection

<u>Question</u>	<u>Response</u>
33) Has the community ever engaged in a media campaign that promoted groundwater quality? If so, what kind?	Meridian Township has conducted numerous media campaigns to raise awareness about the protection of groundwater. Most notable of these efforts has been the use of PSAs on Meridian's HOM TV station as well as the community newsletter, the Towne Courier. One of the most successful attempts at education has been the use of experts in the field, as guest speakers, to address the community's environmental commission.
34) Is the community actively involved in the Children's Water Festival?	Meridian Township is not actively involved in the Children's Water Festival; although, Haslett and Okemos schools are regular participants.

Information Sharing & Data Management

Wellhead Protection

<u>Question</u>	<u>Response</u>
35) When a community delineates a new wellhead protection area, is the information shared with other communities within the 10-year time of travel?	When Meridian Township delineates a new Wellhead Protection Area, communities within the 10-year time of travel are notified of this new WHPA; however this has not been done in over a decade.
36) Have any new public wells been drilled in the community since 2005, when the latest delineations occurred?	No, the last well was installed in 2000.

Groundwater Protection

<u>Question</u>	<u>Response</u>
37) Are local groundwater regulations reviewed by a regional authority prior to implementation? Are their standards met?	When new local regulations are drafted, they are typically reviewed by the Tri-County Regional Planning Commission (TCRPC). The most current regulations for groundwater were amended to the zoning ordinance in 1998 per recommendations by Mark Wyckoff of the Planning and Zoning Center in cooperation with TCRPC.
38) To whom are questions directed when the community's zoning administrator or planning staff is in need expert or technical assistance when a question related to groundwater is unknown?	When Meridian Township's planning and zoning staff has a question regarding groundwater issues that require expert or technical assistance, they seek assistance from a number of sources depending on the problem. Past contacts have been the Township's on-staff engineer, TCRPC, East Lansing-Meridian Water & Sewer Authority, MDEQ, and Ingham County Health Department.
39) How is your community represented on the Groundwater Management Board?	Meridian Township is represented on the regional Groundwater Management Board by Ray Severy of the Department of Public Works & Engineering. Additionally, Rick Brown (associate planner) and Martha Wyatt (landscape architect) are on the Board's ordinance sub-committee.
40) Does your community maintain basic data GIS data on wells and WHPA's?	Yes
41) What is the local department that is primarily responsible for mapping and GIS? Is this data shared with regional and state entities as updates become available?	The local department responsible for managing Meridian Township's GIS data is the I.T. Department at the Township. The I.T. Department shares updates with regional and state authorities whenever they are requested.

SWOT Analysis

Based on a community's internal (the answers provided from the question-and-answer portion of the audit) and external (demography and geography) factors, an analysis of strengths, weaknesses, opportunities, and threats (SWOT) has been created. This SWOT analysis aids in the identification of barriers and gauge the community's potential room for improvement.

Strengths

- Planning Department is very knowledgeable about overall WHP process
- Information is shared across agencies and communities
- Maintains a regularly updated environmental checklist
- Township board and planning commission are generally in favor of wellhead protection efforts
- Actively participates in media campaigns
- New uses require comprehensive on-site inspections (building and outdoors)

Weaknesses

- Groundwater Recharge Protection Area is unenforceable
- Does not provide plugging assistance for abandoned wells
- Zoning ordinance does not set limits on volumes of fuels and chemicals able to be stored on-site and does not require storage of fuels in an area with an impervious floor without a floor drain
- Lack of data on private abandoned wells
- No zoning provision for the demolition of structures that include the protection of wells as a standard

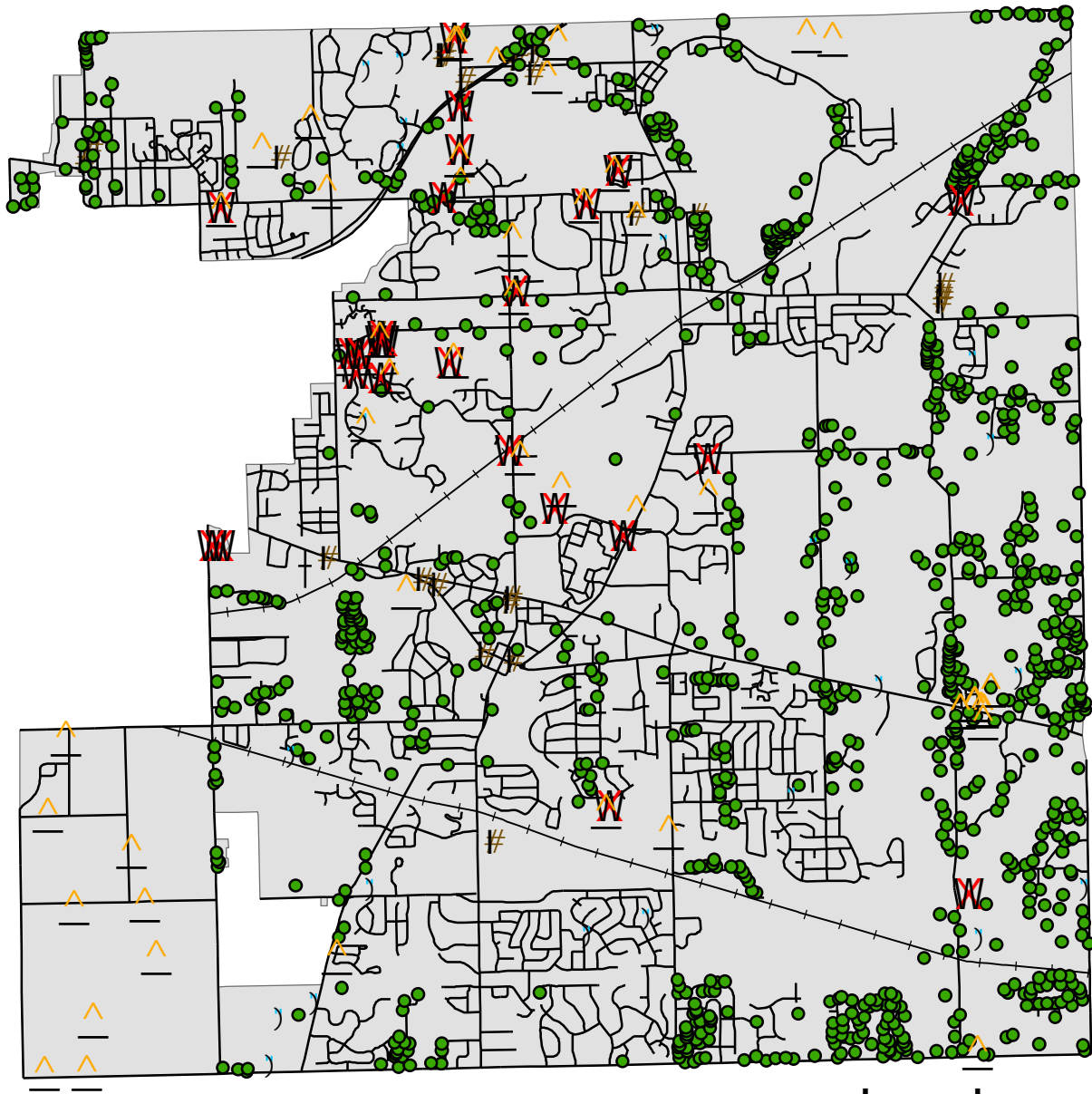
Opportunities

- Groundwater Recharge Protection Area framework laid out, but incomplete; interest in completing
- Community resources (particularly HOM TV and Towne Courier) allow for many PR opportunities









Threats

- Reduced state and federal funding threatens local wellhead protection efforts
- Large amount of private household wells within urbanized residential areas

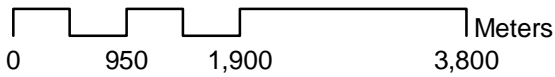
Meridian Charter Township Wells



Legend

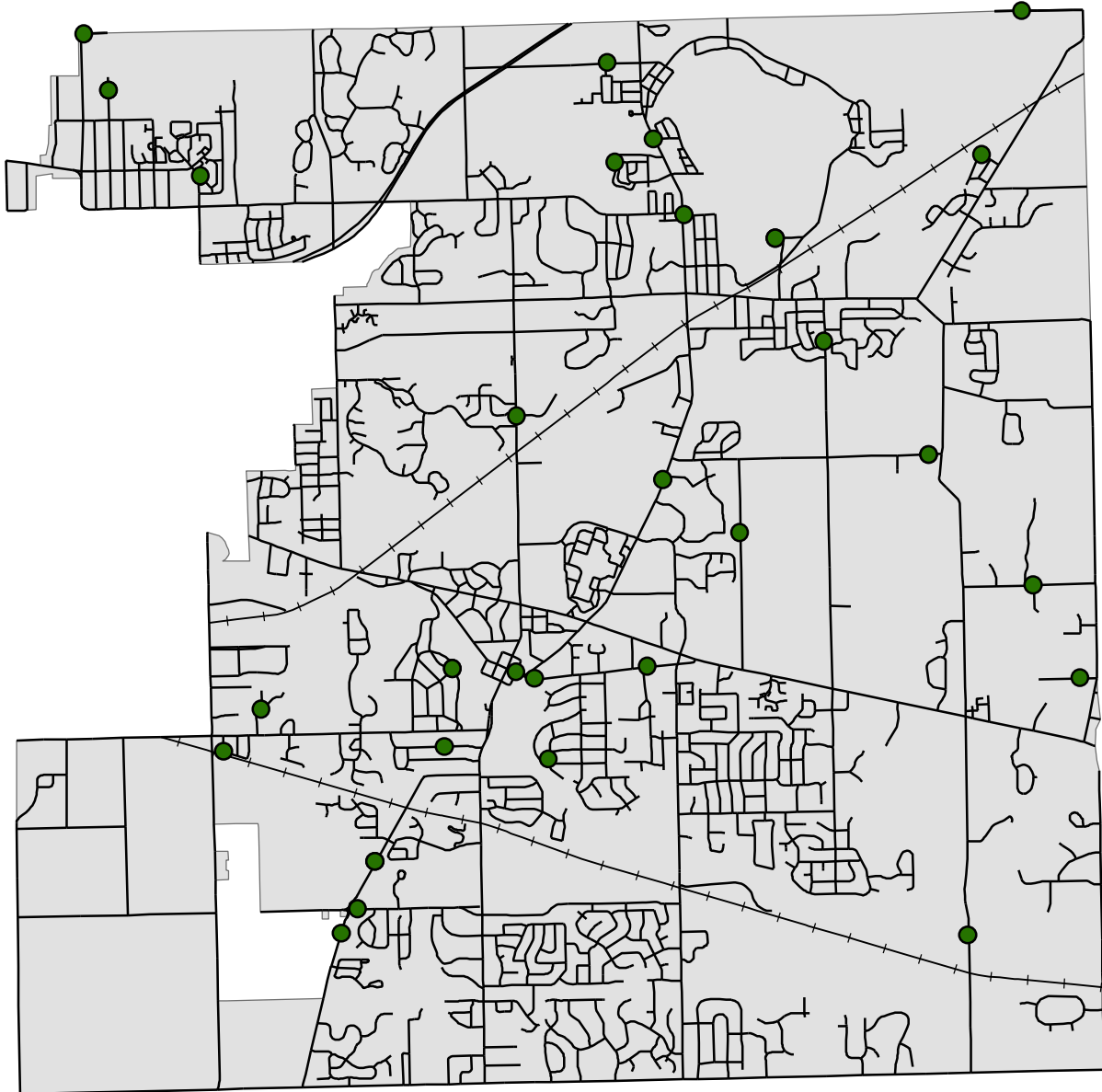
-  Public Wells
-  Test Wells
-  Irrigation Wells
-  Private Wells
-  Monitoring Wells
-  Railroad
-  Roads
-  Meridian Charter Township

4



Source: Tri-County Regional Planning Commission and Info Geographics "Wellhead Protection Viewer" Program (November 9th, 2010)

Meridian Charter Township Plugged Wells Since 2005



4

Legend

- Plugged Wells since 2005
- +— Railroad
- Roads
- ▭ Meridian Charter Township

0 950 1,900 3,800 Meters

Source: Tri-County Regional Planning Commission and Info Geographics "Wellhead Protection Viewer" Program (November 9th, 2010)

COMPARATIVE CASE STUDY: BATTLE CREEK, MICHIGAN

Wellhead Protection Planning

As for comparison, Battle Creek, MI was chosen by our client to compare this city to the tri-county area. Battle Creek is known for their thoroughly developed program for wellhead protection. Their Wellhead Protection program utilizes many resources and regulations that help to prevent contamination in WHPAs. They have determined the area, which contributes groundwater to its wells. These areas were graphically drafted into a 10-year time of travel. In essence, this shows how long a contamination of a well could travel in 10 years. Battle Creek also has requirements to identify known and potential sources of contamination. Examples of these could be leaking underground storage tanks, spills of hazardous chemicals from industrial sites, and transportation accidents. These areas, along with the 10-year time of travel have been drafted into WHPA zones. On top of these, detailed contingency plans were made including routine monitoring discovery, contaminant release from a site within the protection area, and a chemical spill from a transportation accident through Battle Creek's "Clean Water Program." Due to the extensiveness of these wellhead and storm water programs, our case study has offered the opportunity to make several recommendations that the Tri-County area has the potential to adopt into their strategies and plans:

- Establish wellhead and storm water protection programs separate of zoning and master plan documents. For example, a "Storm water reference manual."
- Choreograph contamination cleanups with the health departments and environmental protection agency
- Ensure that environmental checklist is current and up to date
- Create a logo the symbolizes wellhead protection areas and post signs with this along roadways to educate the public when entering a WHPA
- Actively participate in public forum on wellhead protection. For example, postings in local paper, message board, radio and television PSAs, community calendars, and encouraging implementation of water protection into school curriculum
- Update GIS maps and programs to have an advanced library of material.



Procedures & Enforcement

The City of Battle Creek has a major Wellhead Protection Plan that deals with the Health Department for much of their WHPA enforcement. The Health Department controls the inspecting and capping of wells, while the city maintains WHPA data. The city does not require Phase 1 environmental assessments to be made or onsite inspections in wellhead areas. The GIS department updates maps and plans essentially upon request from third parties.

In terms of groundwater protection, Battle Creek takes a unique approach to the subject. They have developed a storm water reference manual that deals with all enforceability aspects to groundwater regulation. Because of this, variances have not been made in the past that affects groundwater protection. There also are no contingency plans specific to the communities for hazardous contaminations. The DEQ and EPA regulate most of these aspects. The environmental checklist has not been updated for a few years, but it still remains pertinent to the current regulations

Education & Outreach

The City of Battle Creek has incredibly well developed public knowledge participations, however their involvement in capping wells has lost its state funding. The city used to have a grant that provided incentives of well reporting however, that grant has run up. Battle Creek has in-depth, ongoing programs for public information. Coupled with storm water education, many issues are brought to mainstream forum. For example, they provide Monthly message calendar (topics pertinent to surface and ground protection) disposing of hazardous waste and contamination issues, Radio commercials. Public Service Announcements, website and before movie ad, Photo contests for their calendar, Notifying of significant events for the current year and a monthly letter to editor to local paper. Schools are also required to include groundwater protection into curriculum. Furthermore, the local officials are often given updates through the groundwater management board as well as a policy committee. Battle Creek also has a groundwater protection logo that they place in sensitive areas.

Information Sharing & Data Management

The wellhead protection areas are longstanding and well developed that new wells are rarely drilled. Due to this, there are not particular regulations for data sharing in the surrounding community.

Groundwater regulations are all done independently, rather than having regional reviews. The Battle Creek wellhead department handles all specialized questions. They also have an in-depth GIS department that regularly provides updated maps and layers.

APPENDIX I:

Glossary

Aquifer - An underground layer of saturated sand, gravel, or rock that contains water in sufficient quantities to supply a well.

Aquifer Performance Test - A test involving the withdrawal of measured quantities of water from a well and the measurement of resulting changes in head in the aquifer at various selected locations.

Aquitard - A saturated but poorly permeable formation that does not yield water freely to a well or a spring. However, an aquitard may transmit appreciable water to or from adjacent aquifers.

Artesian (Confined) Well - A well that penetrates through or into an impermeable layer of silt, clay, or rock. The water level in these wells rises above the upper surface of the aquifer due to the pressure in the confined aquifer. If the water pressure is great enough, the well will overflow the top of the land surface or well (flowing artesian).

Bedrock - A general term for the consolidated (solid) rock that underlies soils or other unconsolidated surficial material.

Capillary Fringe - The zone at the bottom of the vadose zone where groundwater is drawn upward by capillary force.

Capture Zone - The surface and subsurface area surrounding a water well or wellfield which supplies a public water system, through which contaminants are reasonably likely to move toward and reach such water well or wellfield within a specified period of time.

Capture Zone Delineation - The determination of the boundaries of the capture zone(s), typically delineated by complex computer groundwater flow programs, involving the input of numerous data, including water levels (heads), pumping volumes, aquifer thickness, transmissivities, recharge values and other aquifer characteristics.

Cone of Influence or Cone of Depression - The cone shaped area around a well where the groundwater level is lowered due to pumping. The shape of the cone is influenced by the underground porosity and water yield of the well.

Contaminant/Pollutant - Any physical, chemical, biological or radiological substance or matter that degrades water quality and/or threatens the safety of its intended use (i.e. drinking water). Some contaminants are only an aesthetic concern, while others are considered hazardous to your health.

Drawdown - The reduction of head at a point caused by the withdrawal of groundwater. In other words, the distance between the static water level and the surface of the cone of depression.

Equipotential Line - An imaginary contour line on the water table or potentiometric surface showing an equal pressure head of groundwater in an aquifer. Normally, water flow is toward these lines.

Evapotranspiration - The combined loss of water from an area through transpiration of plants and evaporation from soil or water.

Glacial Drift - A general term for unconsolidated sediment transported by glaciers and deposited directly on land or in the sea.

Groundwater - Water beneath the surface of the earth, which saturates the pores and fractures of sand, gravel and rock formations.

Hydraulic Conductivity - The rate of flow of water in gallons per day through a cross-section of one square foot under a unit hydraulic gradient (gpd/ft²), at the prevailing temperature. See permeability.

Hydrogeology - The science dealing with the interrelationships of geologic materials and processes with subsurface waters and related geologic aspects of surface waters.

Hydrologic Cycle - The continuous circulation of water between the earth and the atmosphere, involving condensation, precipitation, runoff, percolation, evaporation and transpiration.

Hydrology - The study of the occurrence, distribution and chemistry of all waters of the earth.

Infiltration/Percolation - The downward flow of water through the pores or spaces of unsaturated rock or soil.

Monitoring/Test/Observation Well - A well drilled and installed in a selected location for the purpose of collecting information regarding aquifer characteristics, such as geologic material, hydraulic parameters, water levels and water quality.

Non-point source of pollution - Contaminants found in water from a source that cannot be specifically defined. For example, contamination resulting from agricultural infiltration or runoff.

Permeability - The capacity of rock or soil to transmit water. See "hydraulic conductivity."

Point source of pollution - Contaminants found in water that can be readily identified from a specific source such as a leaking underground storage tank.

Porosity - The spaces (voids) between particles of earth materials, such as clay, silt, sand, gravel, and rock. It is measured as the ratio of the volume of openings to the total given volume.

Potentiometric Surface - An imaginary surface representing the total head of groundwater in a confined aquifer, defined by the level to which water will rise in a well.

ppb (parts per billion) - A ratio used to describe the proportion of one substance to another. In terms of time, 1 ppb is equal to one second in 32 years; also is equal to 1 drop in a 10,000-gallon tank. Also is measured as micrograms per Liter (ug/L).

- A ratio used to describe the proportion of one substance to another. In terms of time, 1 ppm is equal to 1 minute in 2 years.

Recharge areas - An area in which water reaches the zone of saturation from surface infiltration from precipitation, surface run-off, or groundwater underflow.

Riparian rights - The essence of riparian rights as a water allocation scheme is that a person who owns land on, alongside or crossed by a natural watercourse has a legal right to access and use the water running through the property.

Saturated zone - The portion of subsurface soil and rock where every available space is filled with water. Aquifers are located in this zone.

Static Water Level - The level of water in a well that is not being affected by withdrawal of groundwater.

Storage Coefficient - The volume of water an aquifer releases from or takes into storage per unit surface area of the aquifer per unit change in head.

Transmissivity - The rate at which water is transmitted through a unit width of an aquifer under a unit hydraulic gradient. Transmissivity values are typically given in gallons per day through a vertical section of an aquifer one foot wide and extending the full saturated height of an aquifer under a hydraulic gradient of 1 (gpd/ft).

Unconfined aquifer - An aquifer with the water table as its upper boundary. Because the aquifer is not under pressure the water level in a well is the same as the water table outside the well. An unconfined aquifer is usually near to the earth's surface causing it to be easily recharged - but contaminated as well.

Unsaturated zone - An area, usually between the land surface and the water table, where the openings or pores in the soil contain both air and water.

Vadose Zone - The zone containing water under pressure less than that of the atmosphere, including soil water, intermediate vadose water, and capillary water. This zone is limited above by the land surface and below by the surface of the zone of saturation (water table).

Watershed - All land and water within a drainage area, defined by topographic high points.

Water table - The top of an unconfined aquifer where water pressure is equal to atmospheric pressure; in other words, the surface between the zone of saturation and the zone of aeration. The water table depth fluctuates with climate conditions on the land surface above and is usually gently curved and follows a subdued version of the land surface topography.

Sources:

"Protect Your Water: Water Vocabulary". City of Kalamazoo. 2011. http://www.kalamazoo.org/portal/water.php?page_id=624#Groundwater.

The Michigan Wellhead Protection Program Guide, 2006. *Michigan Department of Environmental Quality*. http://www.michigan.gov/documents/deq/deq-wb-dwehs-swpu-whpguide_book_256483_7.pdf

Wellhead and Groundwater Protection Audit Tool: [Municipality]

Master Plan

This section is to be completed by relying on the community's master plan document as well as any supplementary adopted plans. This section is broken into two parts with specific questions for: wellhead protection and groundwater protection. This is done in order to make direct wellhead protection planning clear. The groundwater specific part includes additional questions related to protecting groundwater resources which have an effect on wellheads. These two categories complement each other and help create a more comprehensive overview. Each question is to be answered with citations as to where the information is found in the legal documents to ensure quick access for reference.

Wellhead Protection

<u>Question</u>	<u>Response</u>
1) Are the wellhead protection areas (WHPAs) included in the plan?	
2) Are WHPAs defined?	
3) Does the community utilize overlay zones for WHPAs?	
4) Is there reference to designated Brownfield sites located within WHPAs?	

Groundwater Protection

<u>Question</u>	<u>Response</u>
5) In the goals and objectives section of the master plan, is the protection of groundwater an issue of importance for the community?	
6) <i>Follow-up:</i> If yes, is the community's strategy for protection noted?	
7) Does the plan evaluate and take into account impacts of future land use changes on groundwater?	
8) Does the plan acknowledge the need for a regional effort for groundwater protection?	
9) Are specific sites with existing or perceived sources of contamination identified in the plan?	

Zoning Ordinance

This section is to be completed by relying on the community's zoning ordinance and site plan review documents. This section is broken into two parts: general zoning ordinance questions and site plan review assessment. The site plan review is usually located within the zoning ordinance, which is why they are organized accordingly. The general zoning ordinance section is further broken down into questions pertaining to wellhead protection and groundwater protection separately. This is again done in order to make a distinction between wellhead protection planning and the topic of overall groundwater protection planning. The site plan review assessment contains questions specific to new development procedures or land use changes. Each question is to be answered with citations as to where the information is found in the legal documents to ensure quick access for reference.

Wellhead Protection

<u>Question</u>	<u>Response</u>
10) Does the WHPA encompass any districts zoned for medium or heavy industrial uses?	
11) Are abandoned water wells, abandoned monitoring wells and cisterns plugged in accordance with regulations and procedures of the Michigan Department of Environmental Quality as well as the county health department?	
12) Do any of the community's ordinances contain regulations on the withdrawal of groundwater (volumes or rates) from industrial/commercial wells?	
13) Does the zoning ordinance include the definitions of materials deemed to be 'hazardous substances'?	
14) Are above ground storage tanks certified, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality? <i>(Source: Mark Wyckoff Recommendations for Tri-County Communities on WHP Regulations, 2000)</i>	
15) Are underground storage tanks registered, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality? <i>(Source: Mark Wyckoff, Recommendations for Tri-County Communities on WHP Regulations, 2000)</i>	

<p>16) Are local regulations present that require bulk storage facilities which house pesticides and fertilizers to be in compliance with Michigan Department of Agriculture requirements?</p> <p><i>(Source: Mark Wyckoff, Recommendations for Tri-County Communities on WHP Regulations, 2000)</i></p>	
<p>17) Does the zoning ordinance set limits on the volume of fuels able to be stored on-site for land uses other than designated fuel storage areas?</p>	
<p>18) Are there any provisions in the zoning ordinance for the demolition of buildings that include the management of wells as a standard?</p>	

Groundwater Protection

<u>Question</u>	<u>Response</u>
<p>19) Are provisions present that explicitly state that no discharge to surface water or groundwater, including direct and indirect discharges of waste, waste effluent, wastewater, pollutants, or cooling water, shall be allowed without approval from appropriate state, county and local agencies?</p> <p><i>(Source: Mark Wyckoff, Recommendations for Tri-County Communities on WHP Regulations, 2000)</i></p>	No
<p>20) Does the zoning ordinance contain provisions for the protection of areas with a high potential for groundwater recharge?</p>	

Site Plan Review Assessment

<u>Question</u>	<u>Response</u>
<p>21) Please indicate which of the following conditions/requirements are present for approval of site plans:</p>	
<p>➤ Existing topographic elevations at two (2) foot contour intervals. Indicate direction of drainage flow.</p>	
<p>➤ The location and elevations of existing water courses and water bodies, including county drains and manmade</p>	

surface drainageways, floodplains, and wetlands.	
➤ Location for on-site wastewater treatment and disposal systems.	
➤ Location of existing and proposed public and private drinking water wells, monitoring wells, irrigation wells, test wells or wells used for industrial processes.	
➤ Description and location for any existing or proposed above ground and below ground storage facilities.	
➤ <i>If floor drains are permitted:</i> The location and status of any floor drains in existing or proposed structures on the site. The point of discharge for all drains and pipes shall be specified on the site plan.	
➤ <i>If floor drains are permitted:</i> Is it a requirement that they be connected to subsurface wastewater disposal systems?	
➤ Inventory of hazardous substances to be stored, used or generated on-site, presented in a format acceptable to the local fire marshal (include Chemical Abstracts Service (CAS) numbers).	
➤ Descriptions of type of operations proposed for the project and drawings showing size, location, and description of any proposed interior or exterior areas of structures for storing, using, loading or unloading of hazardous substances, hazardous wastes, and/or polluting materials.	
➤ Completion of the Environmental Permits Checklist on the form provided by the Zoning Administrator.	
➤ Does the zoning ordinance contain specific provisions for the on-site handling, storage, use, and manufacture of chemicals?	
➤ If yes to the previous question, does the zoning ordinance explicitly state that the storage of fuels, chemicals, and other hazardous substances will be stored in a location with an impervious floor that lacks floor drains?	

Interview Questions

This section is to be completed by relying on the community's representatives that are responsible for wellhead and groundwater protection. A combination of the following may be necessary to complete this section, examples of appropriate persons include: planners, engineers, public works officials, and health department representatives. These persons should have access to specific information pertinent to the municipality. Some of the questions listed in this audit tool are specific to mid-Michigan and this particular area. The interview part is divided into three sections: procedural and enforcement, education and outreach, and information sharing and data management. Each of these sections is then broken into specific questions for: wellhead protection and groundwater protection. The answers to these questions will help provide a basis for analyzing wellhead and groundwater protection planning. It is important to note who was interviewed, as well as the date to ensure proper reference.

Interview Subject: Tracy Miller (Director of Community Development, Delhi Township)

Date/Time: 3/16/2011

Location: E-mail Correspondence

Procedural & Enforcement

Wellhead Protection

<u>Question</u>	<u>Response</u>
22) Does the community require onsite inspections of new land uses in WHPAs?	
23) How often are plugged wells inspected?	
24) Is a Phase I Environmental Assessment required before starting development in a WHPA?	
25) How often are new WHPAs assessed and integrated into maps and plan?	

Groundwater Protection

<u>Question</u>	<u>Response</u>
26) Are there any difficulties with the enforceability of any groundwater regulations in the community's zoning ordinance?	
27) Within the past three years, have any variances been given that affect groundwater regulations?	
28) Does the community require potentially contaminating land uses to submit contingency plans for emergency response? Do these plans ensure protection from discharges and spills to groundwater?	

29) In what instances does the municipality require groundwater monitoring?	
30) Do you have and use an environmental assessment checklist? How often is this updated?	

Education & Outreach

Wellhead Protection

<u>Question</u>	<u>Response</u>
31) Does the community provide incentives in reporting and plugging private abandoned wells?	
32) Does the community have signs to build awareness about WHPAs?	

Groundwater Protection

<u>Question</u>	<u>Response</u>
33) Has the community ever engaged in a media campaign that promoted groundwater quality? If so, what kind?	
34) Is the community actively involved in the Children's Water Festival?	

Information Sharing & Data Management

Wellhead Protection

<u>Question</u>	<u>Response</u>
35) When a community delineates a new wellhead protection area, is the information shared with other communities within the 10-year time of travel?	
36) Have any new public wells been drilled in the community since 2005, when the latest delineations occurred?	

Groundwater Protection

<u>Question</u>	<u>Response</u>
37) Are local groundwater regulations reviewed by a regional authority prior to implementation? Are their standards met?	

38) To whom are questions directed when the community's zoning administrator or planning staff is in need expert or technical assistance when a question related to groundwater is unknown?	
39) How is your community represented on the Groundwater Management Board?	
40) Does your community maintain basic GIS data on wells and WHPA's?	
41) What is the local department that is primarily responsible for mapping and GIS? Is this data shared with regional and state entities as updates become available?	

SWOT Analysis

Based on a community's internal (the answers provided from the question-and-answer portion of the audit) and external (demography and geography) factors, an analysis of strengths, weaknesses, opportunities, and threats (SWOT) has been created. This SWOT analysis aids in the identification of barriers and gauge the community's potential room for improvement.

<u>Strengths</u> <ul style="list-style-type: none"> • • • 	<u>Weaknesses</u> <ul style="list-style-type: none"> • • •
<u>Opportunities</u> <ul style="list-style-type: none"> • • • 	<u>Threats</u> <ul style="list-style-type: none"> • • •

Assessment of Wellhead Protection Program for **DELHI CHARTER TOWNSHIP**

Master Plan

Wellhead-Specific Provisions:

In the Master Plan, Delhi Township does include reference to wellhead protection areas (WHPAs). And although not directly defined in the plan, WHPAs are referenced by the Regional Computer Aquifer Model from the Groundwater Management Board, which was created in 1983 (2007 Master Plan for Delhi Township, pg. 66). Delhi Township does acknowledge that WHPAs cross township boundaries, implying a need for regional management. As is consistent with the region, they do not use overlay zones for WHPAs. Designated Brownfield sites located within WHPAs are not referenced in the plan.

Groundwater-Specific Provisions:

Delhi Township emphasizes the importance of groundwater protection in their master plan in the “Environment Visions and Goals” section (2007 Master Plan for Delhi Township, pg. 71). In this section, Delhi Township’s strategy calls to “...embrace the characteristics of the natural environment by adopting policies, regulations, zoning and plans that preserve environmental resources from the impacts of development and enhance them to the extent possible” (2007 Master Plan for Delhi Township, pg. 71). Delhi Township’s Master Plan does take into account impacts of future land use changes on groundwater. It specifically states that “Delhi Township can work cooperatively with the Board of Water and Light so that areas already selected for future municipal wells are taken into consideration when making land use decisions” (2007 Master Plan for Delhi Township, pg. 62).

There is a mentioning of a need for regional efforts for groundwater and wellhead protection as well as regional growth models in Delhi’s Township’s master plan as part of their strategy for protection mentioned above. The plan does identify sites with existing or perceived sources of contamination denoting “201” and LUST sites, maintained by the Ingham County Health Department and Michigan Department of Environmental Quality (MDEQ) (2007 Master Plan for Delhi Township, pg. 63).

Zoning Ordinance

Wellhead-Specific Provisions:

Based on a comparison of zoning maps and WHPA maps, it is apparent that the Industrial Warehouse District which allows for the storage of fuels, chemicals, and hazardous waste (which pose a potential risk to wellheads) resides within a WHPA. The ordinance does state that wells are plugged in accordance with regulations from MDEQ and the Ingham County Health Department. However, the ordinance does not contain regulations on the withdrawal of groundwater volumes or rates from wells. The ordinance does have explicit definitions of ‘hazardous substances’. They are compatible with the definitions given by United States Comprehensive Environmental Response Compensation and Liability Act (CERCLA).

Hazardous substances cited in Delhi Township include substances designated pursuant to the Federal Water Pollution Control Act, the Solid Waste Disposal Act, and also the Toxic Substance Control Act (section 6.75). Specific regulations exist for above ground and underground storage facilities in accordance with the MDEQ. Similarly, regulation for built storage facilities that house harmful fertilizers and pesticides are stated in the ordinance again in accordance with a state entity, the Michigan Department of Agriculture. These storage strategies were part of Mark Wyckoff's *Recommendations for Tri-County Communities on WHP Regulations* from 2000 (Appendix IV). The zoning ordinance does not set limits on volumes of fuels that are stored on-site for land uses other than designated fuel storage areas. Also, the management of wells as a standard for demolition is not an included provision in the zoning ordinance.

Groundwater-Specific Provisions

Mark Wyckoff's recommendations from 2000 also include provisions that regulate discharges to surface water or groundwater. Whether direct or indirect, it is recommended that discharges are not allowed without approval from the proper state, county or local agencies; Delhi Township's zoning ordinance does not include this provision. The zoning ordinance does contain provisions for the protection of areas with a potential for groundwater recharge specifically in Delhi Township's Industrial Warehouse District.

Site Plan Review:

In Delhi Township's site plan review process, specific provisions relating to groundwater protection must be present before approval. Two-foot contour intervals are required with off-site elevations, along with a drainage plan addressing natural drainage, storm sewer systems, subdrainage, and soil sediment and erosion control (section 3.3).

It is required to specify the locations (and elevations when applicable) of: of watercourses and water bodies, including county drains and manmade surface drainage ways, floodplains, and wetlands; and "on-site wastewater treatment and disposal systems"- this is not specifically stated, however the location of on-site sanitary sewer services and waterlines is required implying the same (section 3.3). It is merely worded differently. Also required is to specify locations of: existing and proposed public and private drinking wells, irrigation wells, test wells or wells used for industrial processes; description and location for any existing proposed above and below ground storage facilities; where floor drains are permitted, the location and status of any floor drains in existing and proposed structures on the site and the point of discharge for all drain and pipes. It is also required the general purpose floor drains be connected to a public sewer system or on-site holding tank in accordance with state, county, and municipal requirements (section 3.3).

Delhi Township does require that an inventory of hazardous substances that will be stored, used or generated on the site to be presented in a format acceptable to the township fire chief (section 3.3). It is also required that descriptions of proposed type operations showing size, location and description of any proposed interior or exterior areas of structures for storing, using, loading or unloading of hazardous substances, hazardous wastes and/or polluting

materials are declared. The completion of the Environmental Permits Checklist provided by the zoning administrator is required for all proposed site plans. The zoning ordinance does not contain provisions for the on-site handling, storage, use and manufacture of chemicals in the site plan review process.

Procedures & Enforcement

Delhi Township does require onsite inspections for new land uses, however these are required for all land use changes not just in WHPAs. Already plugged well inspections are completed by the Ingham County Health Department, but these inspections are not required. A Phase I Environmental Assessment is not always required through the township government, but is usually required by a lender for a project, but again this is not a specific requirement relative to wellhead protection planning.

There do not seem to be any perceived difficulties with the enforceability of groundwater regulations in Delhi's zoning ordinance. There have not been any variances given that affect groundwater regulations in the past three years. The community does require potentially contaminating land uses to submit contingency plans including: Pollution Incident Prevention Plans (PIPPs) and Fire Fighter Right-to-Know (FFRTK) reports. Delhi Township does not specifically require groundwater monitoring. This is typically state mandated. Delhi Township utilizes the standard Ingham County Environmental Permits Checklist, therefore it has yet to be updated since initial development.

Education & Outreach

Delhi Township does not currently provide incentives for plugging abandoned wells due to funding constraints. However, the Township does require that wells are properly plugged when a property owner seeks connection to a public water supply. The community does not have WHPA signage, but they do have other signs acknowledging environmentally sensitive areas including: watershed prosecution area signs, park signs alerting residents about dumping, and rain garden signs explaining the effects of stormwater on aquifer recharge.

The township participates along with the Tri-County Regional Planning Commission (TCRPC) on media campaigns aimed at promoting groundwater quality. They also have an annual Publicly Owned Treatment Works Open House, where people are invited to the sewage treatment plant for an educational tour.

Information Sharing & Data Management

Delineating WHPAs for Delhi Township is the responsibility of the Lansing Board of Water and Light. Local groundwater regulations are reviewed by the TCRPC prior to implementation and

Delhi Township meets their standards for these regulations. They also use the TCRPC as a resource when a community's zoning administrator or planning staff is in need of technical assistance related to groundwater. Delhi Township actively participates on the Groundwater Management Board by attending meetings regularly. The township does maintain basic GIS data on wells and WHPAs that are provided by the state. The IT Department at the township is primarily responsible for mapping and GIS. This data is shared regionally among GIS professional to ensure data sharing and consistency.

Assessment of Wellhead Protection Program for **DELTA CHARTER TOWNSHIP**

Master Plan

Wellhead-Specific Provisions:

In the Master Plan, Delta Township does not specifically define or delineate any type of wellhead or wellhead protection areas (WHPAs). As is consistent with the region, they do not use overlay zones for WHPAs. Designated Brownfield sites or contaminated sites are not designated in the plan, so it does not address if any are located within a WHPA.

Groundwater-Specific Provisions:

Delta Township notes the importance of groundwater protection in their master plan through the statement of their environmental goals. Based on the goal to “Protect and enhance groundwater aquifers, natural recharge areas and surface water resources from contamination,” Delta outlines a specific strategy to protect these resources (2004 Comprehensive Plan for Delta Charter Township, pg. 94). The plan addresses the potential contrast of future land use changes and groundwater protection, ranking the issue as a possible problem compared to other land uses and infrastructure. Delta also acknowledges the importance of a regional effort in groundwater protection by committing to TCRPC’s management plan and ordinance amendments. No specific contamination sites are noted in the plan.

Zoning Ordinance

Wellhead-Specific Provisions:

The zoning ordinance in Delta Township currently permits general industrial land uses within designated wellhead protection areas. These uses include storage facilities, manufacturing facilities and other potentially contaminating uses. While the ordinance does not explicitly state it, wells are plugged in accordance with regulations from MDEQ and the Eaton County Health Department. The volumes or rates of withdrawal for industrial or commercial wells are not limited in the zoning ordinance. Regulating the storage of hazardous substances is an important part of pollution prevention, and in Delta Township’s zoning ordinance, these are “defined as a chemical or other material which is or may become injurious to the public health, safety, or welfare or to the environment.” Specific regulations exist for above ground and underground storage facilities, however, they are not explicitly in accordance with MDEQ guidelines. Similarly, for bulk storage facilities that house harmful fertilizers and pesticides, Delta Township has guidelines in place that regulate their storage, but they are not explicitly based on Michigan’s Department of Agriculture requirements. Furthermore, the zoning ordinance does not limit the volume of fuel storage on a site that is not a designated fuel storage site. All of these storage strategies were part of Mark Wyckoff’s *Recommendations for Tri-County Communities on WHP Regulations* from 2000. The demolition of a building can effect wellhead protection, and although demolitions are regulated by Delta Township, the management of wells is not included as a standard of this section.

Groundwater-Specific Regulations:

Mark Wyckoff's recommendations from 2000 also include provisions that regulate discharges to surface water or groundwater. Whether direct or indirect, it is recommended that discharges are not allowed without approval from the proper state, county or local agencies and Delta Township's zoning ordinance does not include this. Other communities in the region use the zoning ordinance to protect areas with high potential for groundwater recharge, but in Delta Township, it is a part of the site plan review process.

Site Plan Review:

In Delta Township's site plan review process, specific provisions protect areas with high potential for groundwater recharge (Delta Charter Township Zoning Ordinance of 1990, Section 19-2). These regulations guard environmentally sensitive areas, like wetlands, from being developed. It is required that the delineation of the existing topographic elevations at two-foot contour intervals, as well as the location and elevation of any existing water courses on the site, signifying the direction and rate of water drainage (1990, Section 19-3).

It is required to specify the locations of: On-site wastewater treatment and disposal systems (1990, Section 19-3); Existing and proposed public and private drinking water wells, monitoring wells, irrigation wells, test wells or wells used for industrial processes (1990, Section 19-3); and existing or proposed above ground and below ground storage facilities (1990, Section 19-3). It is not, however, explicitly required to specify the location of any floor drains in existing or proposed structures on the site. It is implied in the zoning ordinance that floor drains are not permitted in material storage facilities, but there are no requirements that in other structures, they must be connected to subsurface wastewater disposal systems (1990, Section 18-49).

Delta Township requires an inventory of hazardous substances that will be stored, used or generated on the site to be presented in a format acceptable by the local fire marshal (1990, Section 19-3). For any site plan, a description of the type of proposed operations is necessary, as well as drawings showing size, location, and description of any structures for storing, using, loading or unloading hazardous substances, waste or other polluting materials (1990, Section 19-3). Additionally, the completion of the Environmental Permits Checklist provided by the zoning administrator is required for all proposed site plans. For Delta Township, Eaton County creates and manages the checklist, and includes many provisions specific to groundwater protection. There are specific provisions in the ordinance for the on-site handling, storage, use and manufacture of chemicals, which is enforced by the provision that prohibits floor drains in hazardous substance storage facilities.

Procedures & Enforcement

For the Charter Township of Delta, there are no reported difficulties with the enforceability of

groundwater regulations in the community's zoning ordinance. Groundwater regulations have not been undermined by variances granted within the past three years, as is customary with their procedures. The community requires potentially contaminating land uses to submit contingency plans for emergency responses through fire department requirements and the building permit process. These plans ensure protection from discharges and spills to groundwater for containment areas and other potentially contaminating land uses. Onsite inspections of new land uses in Wellhead Protection Areas are required and treated no differently than any other development project, and all types of residential zoning are allowed there. There is no requirement, however, to inspect plugged wells, and Eaton County handles the closing of them. A phase I Environmental Assessment is not always required through the township government, but is usually required by a lender for the project. New Wellhead Protection Areas are typically not assessed and integrated to maps and plans, as Delta Township relies on the Tri-County Regional Planning Commission for this. There are no specific instances where groundwater monitoring is required locally, and the responsibility is left to the state or county. Delta Township has and uses an environmental permits checklist that was adopted when Mark Wyckoff made his original recommendations (Appendix IV).

Education & Outreach

TCRPC engages in media campaigns that promote groundwater quality, so Delta Township has relied on them for this aspect of Wellhead Protection. As far as outreach is concerned, the community does not use the Capital Area Groundwater Alliance website to educate their public officials, and they do not have signage that designates WHPAs. They also do not participate in the Children's Water Festival through TCRPC, however have held their own event called Greener Delta which is currently suspended. Delta County's outreach initiatives do provide incentives for reporting and plugging private abandoned wells by paying half of the cost, up to \$600.

Information Sharing & Data Management

Groundwater regulations are reviewed by TCRPC prior to implementation and Delta Township meets their standards for these regulations. They also use Tri-County as a resource when a community's zoning administrator or planning staff is in need of technical assistance related to groundwater. Gary Bozek, Senior Planner for Delta Township represents the community on the local Groundwater Management Board. The county engineering and IT departments share responsibility for mapping and GIS, and this data can be shared readily upon request. There are no current specific groundwater-based GIS layers, however a newly purchased software program is expected to aid in the development of this. When TCRPC delineates a new wellhead protection area, they are responsible for sharing the information with other communities within the 10-year time of travel, even if the area is in Delta Township. Public wells are drilled by the county health department and not regulated by planning and zoning, but their own set of standards.

Assessment of Wellhead Protection Program for **THE CITY OF EAST LANSING**

Master Plan

Wellhead-Specific Provisions:

The Master Plan for the City of East Lansing does not specifically reference wellheads nor Wellhead Protection Areas. The plan does reference Brownfield sites, but not their potential impact on WHPAs. The environmental section of the plan, which mentions the need to “enhance community assets such as public services, public facilities and the physical environment (The 2006 Comprehensive Plan for East Lansing, pg. 113),” could include WHPAs, but does not do so explicitly.

Groundwater-Specific Provisions:

Similarly, the afore-mentioned environmental section quotation is interpreted as the documents only reference to groundwater protection. The Master Plan does use overlay zones, but only for residential rental restriction districts. There are two mentions to contamination sites. First, it mentions Burcham Park being a former landfill and currently, its surface has been 25% plugged to prevent contaminants from harming the environment (2006, pg. 64). The second states a site of a vacant gas station at Saginaw Street and Abbott Road that would make it eligible for redevelopment for tax advantages.

Zoning Ordinance

Wellhead-Specific Provisions:

No medium or heavy industrial uses encompass the City of East Lansing’s WHPAs. This greatly reduces the potential sources of contamination the city could encounter. However, there are other restrictions in place that help to reduce the threat to wellheads from any development.

With regard to abandoned wells, The City of East Lansing’s zoning code, last updated in 2010, states in section 50-38 part 5i that “abandoned water wells (wells that are no longer in use or are in disrepair), abandoned monitoring wells, and cisterns shall be plugged in accordance with regulations and procedures of the Michigan Department of Environmental Quality.” In addition, the city follows the Michigan Department of Environmental Quality’s standards regarding both above ground storage tanks and underground storage tanks. Section 50-38 part 5g states “Aboveground storage tanks shall be certified, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality.” Preceding this ordinance in section 50-38 part 5f states that “underground storage tanks shall be registered, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality.”

The City of East Lansing defines a hazardous material as a “Substance or combination of substances which, because of its quantity, concentration, or physical, chemical, or infectious

characteristics may either cause, or significantly contribute to, an increase in serious reversible and irreversible, or incapacitating illness or pose a substantial present or potential hazard to humans or the environment.” Section 36- 142 also goes to explain specific materials and gases that classify into the hazardous category.

The zoning ordinance has many varying rules that restrict developments actions that could contaminate groundwater through their wellheads. There are regulations present for the storage of pesticides. Section 50-38 part 5h require “bulk storage facilities for pesticides and fertilizers shall be in compliance with requirements of the Michigan Department of Agriculture.” East Lansing has ordinances that protect the demolition of buildings from damaging the natural environment. Section 20-66 does not allow “the removal or demolition of any structure which is dangerous, unsafe and insanitary.”

However, the city’s ordinances fails to include some ordinance that could help protect their wellheads. None of the community’s ordinances contain regulations on the withdrawal of groundwater from industrial or commercial wells. This is currently not a big issue because the city has few industrial sites that have the potential to contaminate wells. In addition, there are no ordinances that set limits on the volume of fuels able to be stored on-site for land uses other than designated fuel storage areas.

Groundwater-Specific Provisions:

The City of East Lansing has provisions present that explicitly state that no discharge to surface water or groundwater, including direct and indirect discharges of waste, waste effluent, wastewater, pollutants or cooling water, to be allowed without approval from appropriate state, county and local agencies. Section 46-87 states that “no person shall discharge, or cause to be discharged, into any storm sewer or natural or artificial watercourse, waters or wastes other than stormwater or uncontaminated industrial wastes as heretofore defined.” The ordinance also contains provisions for the protection of areas with a high potential for groundwater discharge. Section 49-14 explicitly rules that “the site provide protection of subsurface water resources and provision of valuable watersheds and recharging groundwater supplies.”

Site Plan Review:

In East Lansing, the site plan review process requires the delineation of the existing topographic elevations at two-foot contour intervals, as well as the location and elevation of any existing water courses on the site (2010, section 50-37: 2). These regulations encompass wetlands, floodplains, and drainage-ways, and provide evidence of the direction and rate of drainage flow for water on the site

It is required to specify the locations of: On-site wastewater treatment and disposal systems (2010, section 50-73: 4j); Existing and proposed public and private drinking water wells, monitoring wells, irrigation wells, test wells or wells used for industrial processes (2010, section 50-73; 4k); existing or proposed above ground and below ground storage facilities (2010, section 50-73: 4n); and the location of any floor drains in existing or proposed structures on the site (2010, section 30-73: 4i).

East Lansing requires for an inventory of hazardous substances that will be stored, used or generated on the site to be presented in a format acceptable by the local fire marshal (2010, section 50-73: 4l). For any site plan, however, a description of the type of proposed operations is necessary, as well as drawings showing size, location, and description of any structures for storing, using, loading or unloading hazardous substances, waste or other polluting materials (2010, section 50-73: 4m).

Finally, the completion of the Environmental Permits Checklist provided by the zoning administrator is required for all proposed site plans. For East Lansing, Ingham County creates and manages the checklist, and includes many provisions specific to groundwater protection.

Procedures & Enforcement

When new land uses are being constructed, the City of East Lansing is onsite almost daily to facilitate the process. This is regardless of whether or not the development is in a WHPA. For any project the city is involved in, a Phase I Environmental Assessment is required. However, if the city is not involved in the project, it is not required, but usually completed anyways. No new WHPAs have been created since the last update to the comprehensive plan, but if any new wells were to be drilled, they would be included when the comprehensive plan was updated. The City of East Lansing has no difficulties enforcing groundwater regulations in the zoning ordinance and in the past three years, no new variances have been given that could affect groundwater regulations. In regards to contamination, East Lansing requires contaminating land uses to propose a written description and these details are submitted to the appropriate departments. Groundwater monitoring is required for gas stations, however the city has little industrial uses and therefore, this is not an issue. During construction, the city uses an environmental assessment checklist which is part of the building permits checklist.

Education & Outreach

Due to a lack of available funds, the City of East Lansing cannot offer any incentives to report and plug private abandoned wells. However, the city is actively involved in media campaigns to promote groundwater protection and WHPAs. The city has placed signs throughout the community that promotes WHPAs, riversheds and certain parks. In addition, the city publishes articles in the Curbside Journal, Dialog and on the city website. The local public schools all participate in the Children's Water Festival that happens annually.

Information Sharing & Data Management

When East Lansing delineates a new WHPA, the newly found information is shared with the surrounding communities. Their main collaborator is Meridian Township because they share a joint water plan. However, no new WHPAs or wells have been drilled in the past five years. The local groundwater regulations are reviewed by multiple groups and when an expert opinion is

needed, the in-house engineers usually can answer any question city officials may have. These engineers also represent East Lansing on the Groundwater Management Board. East Lansing is unsure if their community shares GIS data regarding wells and WHPAs. However, Public Works is the local department that is responsible for mapping and GIS for the community. This information is available for public use, but must be requested.

Assessment of Wellhead Protection Program for
THE CITY OF LANSING

Master Plan

Wellhead-Specific Provisions:

The project team reviewed the 1958 City of Lansing Master Plan which is immensely outdated. The city is currently updating its Master Plan; however, at the time of this report the outdated draft was not available for review. In 1958, Wellhead Protection was not of an issue; therefore it is literally not of topic at all in the Master Plan. The plan does not state any Wellhead Protection Areas, nor define the concept at all. The plan also does not make mention of the important of location of wells, public or private, and Brownfield developments have little play in the plan.

Groundwater-Specific Provisions:

Unlike wellhead protection areas, the 1958 Lansing Master Plan does incorporate some groundwater objectives, however, they are still minimal at best. Groundwater protection is not of concern in the Master Plan, but it does bring up the importance of adapting wells and groundwater in respect to the growing needs and changing land uses of the community. "Residential development should be permitted only where it can readily be serviced with such facilities as sewer and water. Developing Areas - In these areas the principal residential growth of the future is expected. Adequate public facilities, such as paved streets, water and sewers, recreation areas, and schools should be provided." (pg. 78 Lansing Master Plan) This only has to do mainly with proper infrastructure for new developments. The master plan does not take into account regional groundwater protection or potential contamination sites.

Zoning Ordinance

The Lansing zoning ordinance has particular definitions for materials deemed to be hazardous. This ordinance has been developed to define hazardous materials as "explosive, pyrotechnics, compressed gas, flammable liquid, flammable solid, combustible liquid, oxidizing material, poisonous gas, poisonous liquid, poisonous solid, irritating material, etiological material, radioactive material, corrosive material or liquefied petroleum gas (pg. 52) ." However, the ordinance is not very particular with its wellhead areas. They are not subject to specific safeguards for pollution.

The zoning ordinance does require a proposed storm water management plan for all site plans. This includes the design of sewers, drains, outlets, and retention or detention ponds. It also requires all above and below ground storage tanks, wells, and fertilizer/pesticide storage units to follow the regulations listed by the MGEQ. 500 feet buffers are required around wetlands to prevent disturbance of these areas. General- purpose floor drains need to be connected to a public sanitary/combined sewer system or an on-site holding tank. General-purpose floor drains, which discharge to groundwater, are prohibited. There is also no limit or regulations on fuel storage or chemical manufacturing. Withdrawal of groundwater in commercial/industrial areas is not regulated nor are special use permits required for wellhead protection areas. Demolition of any structure that is listed as a Michigan 201 Site and/or has old wells or septic systems is required to gain a permit before action can be taken.

Site Plan Review:

The site plan review process for the City of Lansing requires the delineation of the existing topographic elevations at two-foot contour intervals, as well as the location and elevation of any existing water courses on the site (1242.05).

It is required to specify the locations of: On-site wastewater treatment and disposal systems (1242.05); Existing and proposed public and private drinking water wells, monitoring wells, irrigation wells, test wells or wells used for industrial processes (11242.05); and existing or proposed above ground and below ground storage facilities (1242.05). The zoning ordinance prohibits floor drains, so they are therefore not addressed in the site plan review process.

Lansing requires for an inventory of hazardous substances that will be stored, used or generated on the site to be presented in a format acceptable by the local fire marshal (1242.05). For any site plan, however, a description of the type of proposed operations is necessary, as well as drawings showing size, location, and description of any structures for storing, using, loading or unloading hazardous substances, waste or other polluting materials (1242.05).

Finally, the completion of the Environmental Permits Checklist provided by the zoning administrator is required for all proposed site plans. For the City of Lansing, Ingham County creates and manages the checklist, and includes many provisions specific to groundwater protection.

Procedures & Enforcement

The City of Lansing has a joint wellhead plan that works hand in hand with the Lansing Board of Water and Light. The municipally owned utility, charged by the city, provides water and power to the region. Much of the information from the planning commission is gained through the Board of Water and Light. Going further, the city of Lansing itself does not have a lot of Wellhead area specific guidelines. Much of these regulations pertain to the whole city. For example, the city requires new developments to be inspected and meet all build code regulations, as well as those set for by the Public Works and guidelines for wellhead safety. The city does not have specific times frames for well inspections. However, it does require Phase 1 environmental assessments are made. These are required at property acquisition. The city lacks in the fact that it does not have a strong Wellhead protection plan and has heavy industrial developments in these areas. However, because it requires safety measures be met and enforced on a major level, it helps to safeguard against contamination.

In terms, the City has many facets of groundwater protection left in the private sector and Lansing Board of Water and Light is primarily responsible for groundwater monitoring. The city has not passed any regulations or variances in the past 3 years that affect groundwater protection. The Fire department is given the responsibility of regulating hazardous and potentially contaminating and Lansing does not have an environmental checklist. This lack of regulation at a city level could pan out to have serious consequences if a major contamination event were to occur.

Education & Outreach

The City of Lansing educates the public about groundwater protection through various programs, but there is little involvement in capping wells. The city does not provide any incentive programs for capping. Yet, they do have active roles in public forums. The city of Lansing actively participates in the Children's Water Festival. They also have set up a detailed groundwater model at the Impression 5 museum and have developed Public Service Announcements that play before movies in the theater. Lansing does not have signs for environmentally sensitive areas.

Information Sharing & Data Management

To the planning staff's knowledge, no new wells have been drilled since 2005. However, the BWL does not notify the city at every new drilling. Also, the surrounding communities do not get notified with updated Wellhead Protection Area information.

The City of Lansing works hand in hand with the Lansing Board of Water and Light and Tri-County Regional Planning Commission for updates to groundwater regulations. These three parties review all updates. Tri-County and BWL are primarily responsible for answering specific questions on the subject, as they are viewed as the experts. Mr. Rieski and representatives from the BWL participate on the Groundwater Management Board. Lansing also has a tech department that is responsible for GIS data to the regional and state entities. All Wellhead Protection Area data is done by United States Geological Survey.

Assessment of Wellhead Protection Program for
LANSING CHARTER TOWNSHIP

Master Plan

Wellhead-Specific Provisions:

Lansing Township references wellhead protection and groundwater protection in two main areas throughout the master plan including sections: Community Vision and Goals (Charter Township of Lansing Master Plan pg. 13) and Natural Resources and Environment (pg. 56, 59). Wellhead protection areas (WHPAs) are not exactly defined in Lansing Township's master plan. The plan does state that "wellhead protection areas have been established to protect groundwater resources from pollution" (Charter Township of Lansing Master Plan pg.56). However, the specific area is not given a traditional definition with a standard. Lansing Township does specifically delineate WHPAs in a map titled "Lansing Township Contaminated Sites" (Charter Township of Lansing Master Plan Map 13, pg. 59). This map is comprehensive in that it also delineates highways, township boundaries, major roads, surface bodies of water, leaking underground storage tanks, and leaking underground storage tanks in wellhead protection areas. Therefore, specific contaminated sites are acknowledged and outlined in the plan within this map. The community does not utilize overlay zones as is consistent with the region.

Groundwater-Specific Provisions:

Lansing Township emphasizes the importance of groundwater protection in their master plan goal and objective section. The goal is titled "Environmental Stewardship" and the corresponding objective states to "continue to participate in and support regional efforts to improve ground and surface water quality" (pg. 13). The strategy calls to "continue to participate in and support regional efforts" (pg. 13). The plan does not evaluate and take into account impacts of future land use changes on groundwater; however they do reference this with surface bodies of water. It is also mentioned in the "Conclusion" section of the master plan where specific strategies are stated for regional collaboration (pg. 58). The need for a regional effort for groundwater protection is also reiterated in the "Implementation, Policy Response" section mentioning participation in regional committees (pg. 81).

Zoning Ordinance

Wellhead-Specific Provisions:

Based on a comparison of zoning maps and WHPA maps (Charter Township of Lansing Master Plan Map 13, pg. 59), it is apparent that WHPAs do encompass medium and heavy industrial uses. The ordinance does state that wells must be plugged in accordance with appropriate local, state, and federal agencies (implying the Michigan Department of Environmental Quality (MDEQ) and the Ingham County Health Department). However, the ordinance does not contain regulations on the withdrawal of groundwater volumes or rates from wells. The ordinance does have explicit definitions of 'hazardous substances'. They are compatible with the definitions given by United States Comprehensive Environmental Response Compensation and Liability Act (CERCLA). Hazardous substances cited in Lansing Township include substances designated pursuant to the Federal Water Pollution Control Act, the Solid Waste Disposal Act, Clean Air Act, Natural Resource and Environmental Protection Act (NREPA) and also the Toxic Substance Control Act (chapter 24-1). This provision also states substances that the MDEQ declares. Specific regulations exist for above ground and underground storage facilities in

accordance with appropriate local, state, and federal agencies (again implying the Michigan Department of Environmental Quality (MDEQ)) (chapter 85-10-4). Similarly, regulation for built storage facilities that house harmful fertilizers and pesticides are stated in the ordinance again in accordance with a state entity, appropriate agencies (chapter chapter 85-10). The zoning ordinance does not set limits on volumes of fuels that are stored on-site for land uses other than designated fuel storage areas. Lansing Township has an entire chapter dedicated to demolition regulations in their zoning ordinance (chapter 109). There are provisions in this chapter specific to the demolition of buildings that include the management of wells as a standard (chapter 109-6, 7, 11).

Groundwater-Specific Provisions:

Whether direct or indirect, it is recommended that discharges are not allowed without approval from the proper state, county or local agencies; Lansing Township's zoning ordinance does include provisions (chapter 85-10.4). The zoning ordinance also contains provisions for the protection of areas with a potential for groundwater recharge in the site plan review and demolition chapters.

Site Plan Review:

In Lansing Township's site plan review process, specific provisions relating to groundwater protection must be present before approval. It is required that existing and proposed topographical contours have at least two foot intervals, this will indicate the direction of drainage flow (chapter 85-11.5). It is also required that specify the locations (and elevations or descriptions when applicable) of: existing watercourses and water bodies, including county drains and manmade surface drainage ways, floodplains, and wetlands; on-site wastewater treatment and disposal systems; existing and proposed public water mains, public and private drinking water wells, monitoring wells, irrigation wells, test wells and wells used for industrial processes; existing or proposed above ground and below ground storage facilities; floor drains in existing or proposed structures on the site, and the point of discharge for all drains and pipes (chapter 85-10.1,4). The township also states that secondary containment facilities shall be provided for above ground storage of hazardous substances, wastes, and potentially polluting materials (chapter 85-10.4). However, when floor drains are permitted it is not required that they be connected to subsurface wastewater disposal systems.

Lansing Township does require that an inventory of hazardous substances that will be stored, used or generated on the site to be presented in a format acceptable to the township fire marshal (chapter 85-10.1). It is also required that descriptions of proposed type operations showing size, location and description of any proposed interior or exterior areas of structures for storing, using, loading or unloading of hazardous substances, hazardous wastes and/or polluting materials are declared (chapter 85-10.1). The completion of the Environmental Permits Checklist provided by the zoning administrator is required for all proposed site plans (chapter 85-10.1). The zoning ordinance does contain provisions for the on-site handling, storage, use and manufacture of chemicals in the site plan review process stating compliance with state regulations and specific distances are required. However, the ordinance does not state that the storage of these chemicals or fuels be stored in a location with an impervious floor that lacks floor drains. This is a containment strategy often used to prevent spillage of potentially contaminating materials.

Procedures & Enforcement

Lansing Township does require onsite inspections for new land uses; however these are required for all land use changes within township boundaries, not just in WHPAs. Already plugged well inspections are completed by the Ingham County Health Department, but these inspections are not required. A Phase I Environmental Assessment is not always required through the township government, but is usually required by a lender for a project, but again this is not a specific requirement relative to wellhead protection planning.

There does seem to be perceived difficulties with the enforceability of groundwater regulations in Lansing Township, not specifically with the zoning ordinance. There is heavy reliance on third party experts regarding groundwater regulation and its implementation. There is a lack of qualified experts that have specific knowledge of the township. Lansing Township does not have a public works or engineering department, both of which usually assist with groundwater provisions. There have not been any variances given that affect groundwater regulations in the past three years. The community does require potentially contaminating land uses to submit contingency plans including Pollution Incident Prevention Plan (PIPP) reports, that are required from state and federal entities like the MDEQ and Environmental Protection Agency (EPA).

Lansing Township does not specifically require groundwater monitoring. The township works with Westside Water and the Lansing Board of Water and Light (LBWL) for water quality reporting. Lansing Township utilizes the standard Ingham County Environmental Permits Checklist; therefore it has yet to be updated since initial development.

Education & Outreach

Lansing Township does not currently provide incentives for plugging abandoned wells. However, the township does require that wells are properly plugged when a property owner seeks connection to a public water supply. The community does have WHPA signs that help build community awareness. They also have watershed and Greater Lansing Regional Committee for Stormwater Management surface water signs. These kinds of signs are proactive measures for protecting groundwater resources.

Lansing Township is not specifically involved in a media campaign promoting groundwater quality. They do however participate in regional campaigns. The township is also actively involved in the Children's Water Festival. This festival is usually held annually and focuses on educating students in the Tri-County region on environmental issues and the importance of groundwater protection.

Information Sharing & Data Management

No new WHPAs have been delineated in Lansing Township since the published 2005 delineations done in accordance with the Tri-County Regional Planning Commission (TCRPC) and U.S. Geological Survey (USGS) (Luukkonen, 2009). No new public wells have been drilled in the community since these delineations occurred in 2005.

Lansing Township works closely with the GLRC and the Groundwater Management Board (GMB) on groundwater protection regulation. The township uses the TCRPC as a resource when a community's zoning administrator or planning staff is in need of technical assistance related to groundwater. Lansing Township participates on the Groundwater Management Board and the Director of Westside Water sits on the board. Westside Water serves as the water department and provider of potable water for citizens on the township's west side. The township

does maintain basic GIS data on wells and WHPAs. The planning department is responsible for mapping and GIS and information is shared as updates become available.

Assessment of Wellhead Protection Program for
MERIDIAN CHARTER TOWNSHIP

Master Plan

Wellhead Specific Provisions:

Although Meridian Township does not identify wellhead protection areas in the master plan, these areas are identified in the Meridian Township Greenspace Plan (pg. 106) Final Report (Figure 2d: Groundwater, p. 9). The text associated with this map describes locations of water treatment facilities, general location of public wells, and wellhead protection areas. The greenspace plan also defines, in text, what a wellhead protection area is; following the State of Michigan's definition which states: "the surface and subsurface areas surrounding a water well, or well field, which supplies a public water system, and through which contaminants are reasonably likely to move toward and reach the water well, or well field within a 10-year time of travel." (pg. 9)

Meridian Township does not reference designated brownfield sites in the master plan, nor their effect on wellhead protection planning in their master plan. They do acknowledge sites of contamination but not brownfields specifically. Similarly, Meridian Township does state that "according to the Ingham County Health Department maps, land along the Red Cedar River, Herron Creek, Foster Drain, and other tributaries of the Red Cedar River are groundwater recharge areas vulnerable to contamination (Map 7-3). The Ingham County Health Department has identified sites where groundwater contamination has occurred in Sections 1, 2, 3, 9, 10, 11, 19, and 23" (pg. 99).

Groundwater Specific Provisions:

Meridian Township references groundwater importance primarily in two areas of the master plan: "Chapter: 2. Community Values, Vision, Goals, and Objectives" (pg.14) and "Chapter 7 - Natural Features" (pg.97-103).

The Township states groundwater protection as a community goal under "Goal 2: Preserve open space and natural areas: Objective D: Protect groundwater recharge areas in the Township" (pg.14). Furthermore, the township lists three strategies including: "1.) Conduct a study to identify all important groundwater recharge areas; 2.) Encourage the development of programs to educate citizens about the importance of protecting groundwater recharge areas; and 3.) Develop a set of public policies to protect the groundwater recharge areas through zoning and other appropriate land management techniques" (pg.14).

The plan acknowledges sites of contamination as a threat to groundwater on a map titled "Groundwater Vulnerability" (Map 7-3 pg. 98 in the Meridian Township Master Plan). Locations are identified on this map but contaminated sites are not described beyond their location.

Zoning Ordinance

Wellhead-Specific Provisions:

Although Meridian Township physically lacks heavy industrial zones and uses, the zoning ordinance provides sections for these types. No medium or heavy industrial zones are present within the wellhead protection area; this greatly simplifies the wellhead protection strategy for the community, as it greatly reduces the threat of industrial-scale discharges near public wells.

Meridian Township's zoning regulations, as they relate to groundwater; follow state and county standards for the storage of fertilizers, fuels, pesticides, and other hazardous materials; the maintenance and decommissioning of underground storage tanks, aboveground storage tanks, and abandoned wells; and discharges to groundwater.

Groundwater-Specific Provisions:

The Township's audit shows that it is lacking in two specific aspects of wellhead and groundwater protection; by not setting provisions for limits on fuels able to be stored on-site for uses not designated as fuel storage areas, and by not setting provisions for the demolition of buildings that include the protection of wells

Site Plan Review:

Meridian Township's site plan review process requires the delineation of the existing topographic elevations at two-foot contour intervals, as well as the location and elevation of any existing water courses on the site (86-154: 8).

It is required to specify the locations of: On-site wastewater treatment and disposal systems (86-154: 8); Existing and proposed public and private drinking water wells, monitoring wells, irrigation wells, test wells or wells used for industrial processes (86-154: 8); existing or proposed above ground and below ground storage facilities (86-154: 15); and the location of any floor drains in existing or proposed structures on the site (86-154: 13, 86-156: 2b-5i)

Meridian Township requires for an inventory of hazardous substances that will be stored, used or generated on the site to be presented in a format acceptable by the local fire marshal (86-5: 9, 86-154: 16-17, 86-156: 2b-5). For any site plan, however, a description of the type of proposed operations is necessary, as well as drawings showing size, location, and description of any structures for storing, using, loading or unloading hazardous substances, waste or other polluting materials (86-5: 9, 86-154: 16-17, 86-156: 2b-5).

Finally, the completion of the Environmental Permits Checklist provided by the zoning administrator is required for all proposed site plans. Meridian Township creates and manages its own checklist, and includes many provisions specific to groundwater protection. It is based on the general regionally-based recommendations, but it has been updated twice to fit the needs of the township. There are specific provisions in the ordinance for the on-site handling, storage, use and manufacture of chemicals, however, no regulations exist that explicitly prohibit floor drains in these storage facilities (86-402).

Procedures & Enforcement

Generally, Meridian Township's regulations as they relate to groundwater and wellhead protection have been enforceable and consistent; there have not been any variances granted in wellhead protection areas within the last three years. However, the Township does have difficulties enforcing its Groundwater Recharge Protection Area (GRPA) overlay districts. An amendment to the Meridian Township Zoning Ordinance in the late 1970's established an overlay district for GRPAs and was based on research by a number of different agencies; none of which covered the entirety of Meridian Township. This inconsistency caused by a lack of

coverage, has essentially rendered the regulation as unenforceable and it is uncertain if further studies will be conducted to complete the coverage area of groundwater recharge areas.

Procedures and enforcement related to wellhead protection in Meridian Township have been very consistent, likely due in part to the community's reliance on an regularly updated Environmental Assessment Checklist; a standardized tool for assessing new development to ensure it meets federal, state, county, and municipal guidelines for environmental compliance. New development is also subject to a comprehensive site inspection, inside and out, by Meridian Township's chief building inspector and landscape architect. This site inspection procedure would include the identification or non-compliance with any wellhead-related features and it is likely that this would be the only time that the Township would ever inspect a plugged well, if it was present.

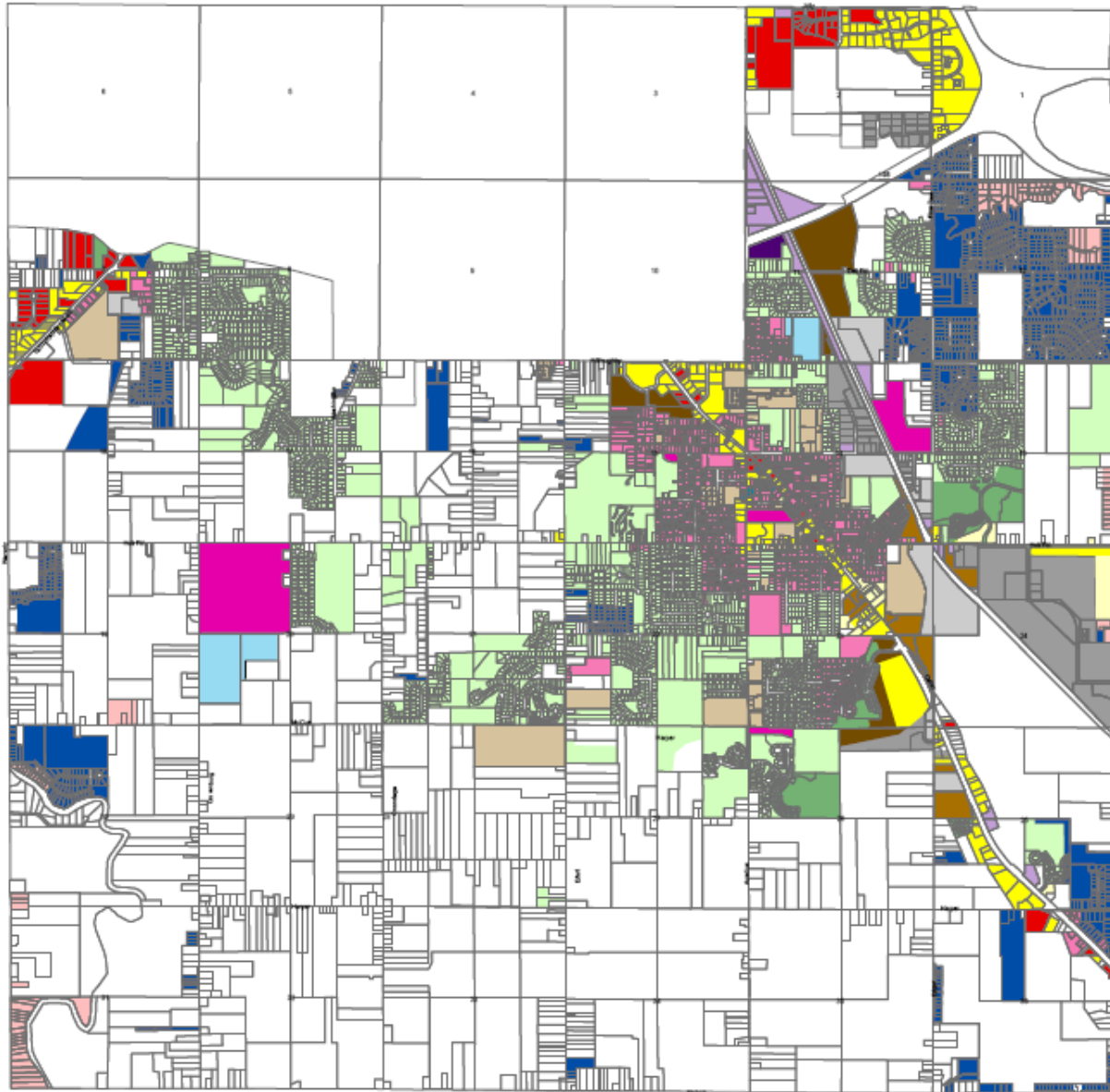
Education & Outreach

Meridian Township's education and outreach strategy utilizes a variety of sources for connecting with the public on wellhead protection issues. Most notably among these outreach attempts has been the use of the community's local public TV channel (HOM-TV), the community newsletter (Towne Courier), and the use of experts in the field as guest speakers to address the Township's environmental commission. Despite these steps to educate the public, Mr. Brown indicated that the community could benefit from still more education on their groundwater resources, possibly by the Township playing a more active part in the Children's Water Festival. Mr. Brown's aspirations aside, the Community appears to be, relatively, ahead of the curve in terms of its wellhead protection PR campaign.

Information Sharing & Data Management

Meridian Township's responses to the "Information Sharing & Data Management" section of the audit tool (and subsequent discussions) indicated that the Planning Department had a strong sense of group-structural awareness in the overall wellhead protection process. Though the department relies heavily on various other agencies for oversight, support, and technical data on groundwater management, Mr. Brown was able to respond knowledgeably about the entire process and displayed a detailed understanding how all the pieces fit together from start to finish, while showing an apparent consciousness of other's responsibilities in the process beyond those the Meridian Township Planning Department. The relationship between Meridian Township and these other agencies (as well as the Township's neighboring communities) appeared to be in synchronization; interview responses showed that, when new data on wellhead protection became available, it would be disseminated among all affected parties.

MAP 5: DELHI CHARTER TOWNSHIP ZONING DISTRICT MAP



ZONING DISTRICT LEGEND

A-1	IM	PP	R-1E
C-1	IP	R-1A	RM
C-2	IR	R-1B	RM-1
C-3	IW	R-1C	TC
IA	PD	R-1D	

0 1,800 3,600 7,200 Feet

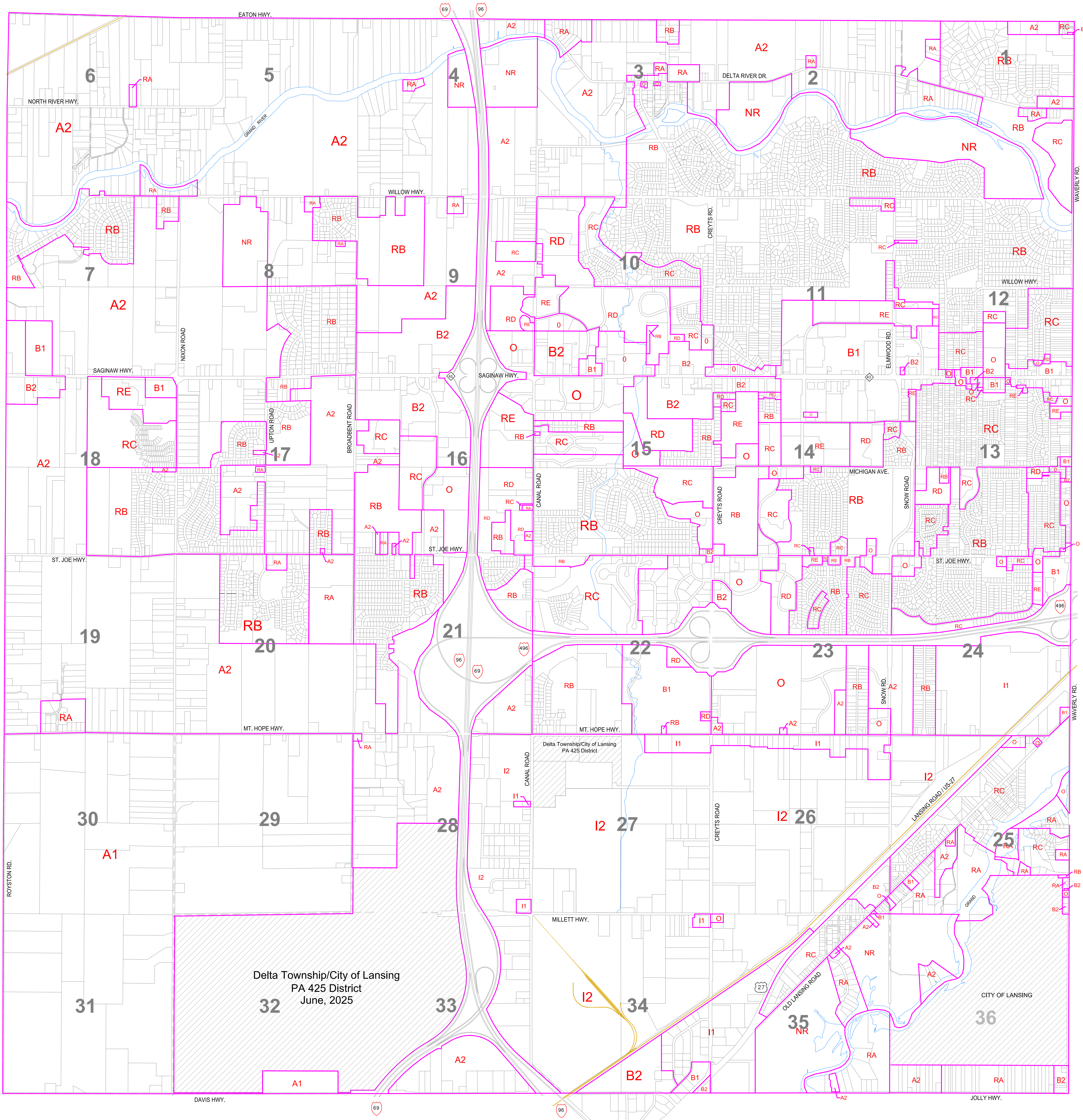


OFFICIAL ZONING MAP OF DELTA CHARTER TOWNSHIP

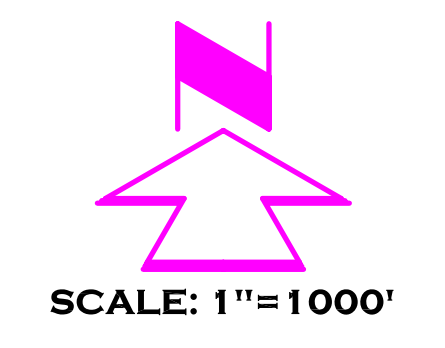


ZONING DISTRICTS

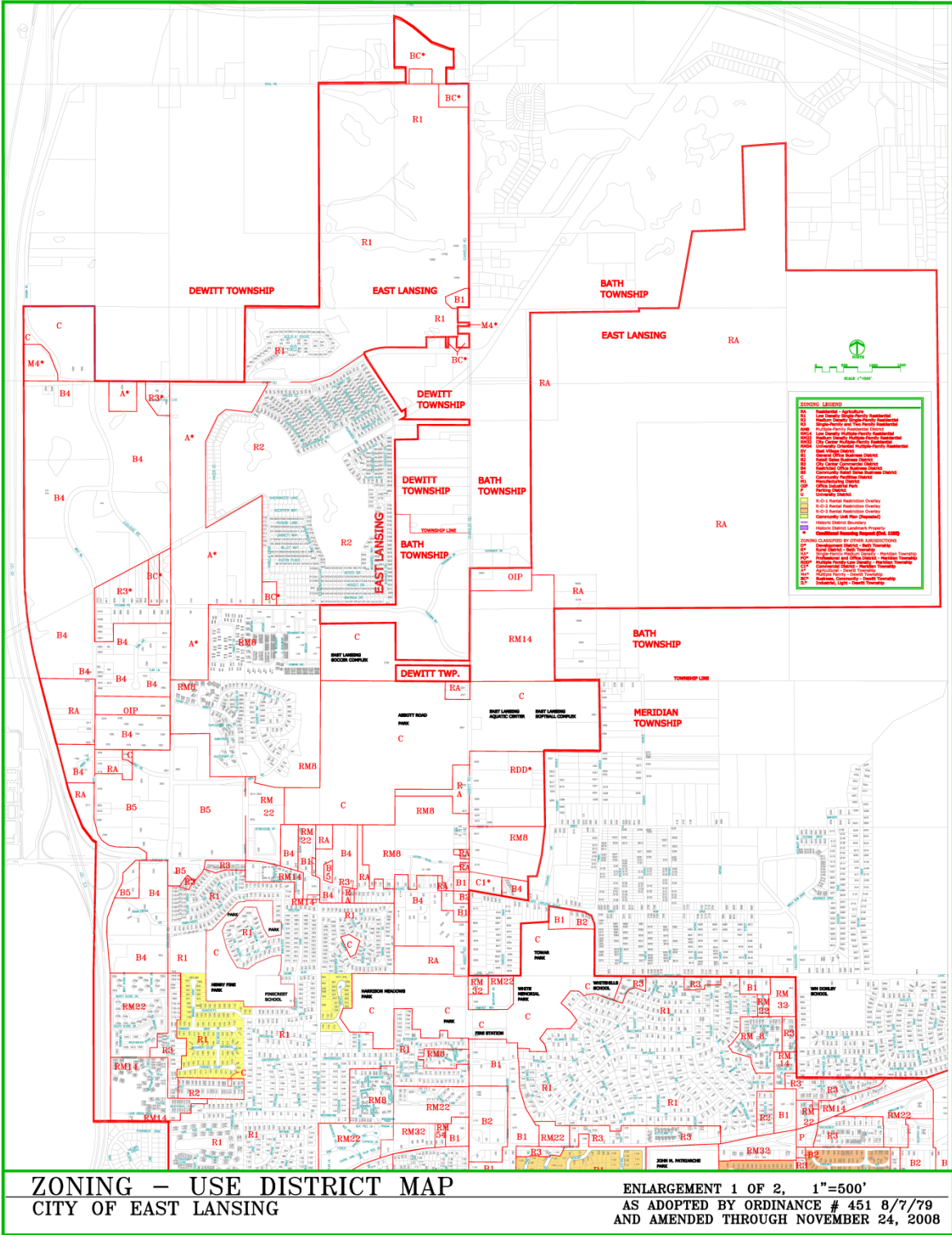
- NR NATURAL RESOURCES
- A1 AGRICULTURAL
- A2 AGRICULTURAL/RESIDENTIAL
- RA VERY LOW DENSITY RESIDENTIAL
- RB LOW DENSITY RESIDENTIAL
- RC MODERATE DENSITY RESIDENTIAL
- RD MEDIUM DENSITY RESIDENTIAL
- RE HIGH DENSITY RESIDENTIAL
- O OFFICE
- B1 LOCAL SERVICE COMMERCIAL
- B2 COMMUNITY COMMERCIAL
- I1 LIMITED INDUSTRIAL
- I2 GENERAL INDUSTRIAL

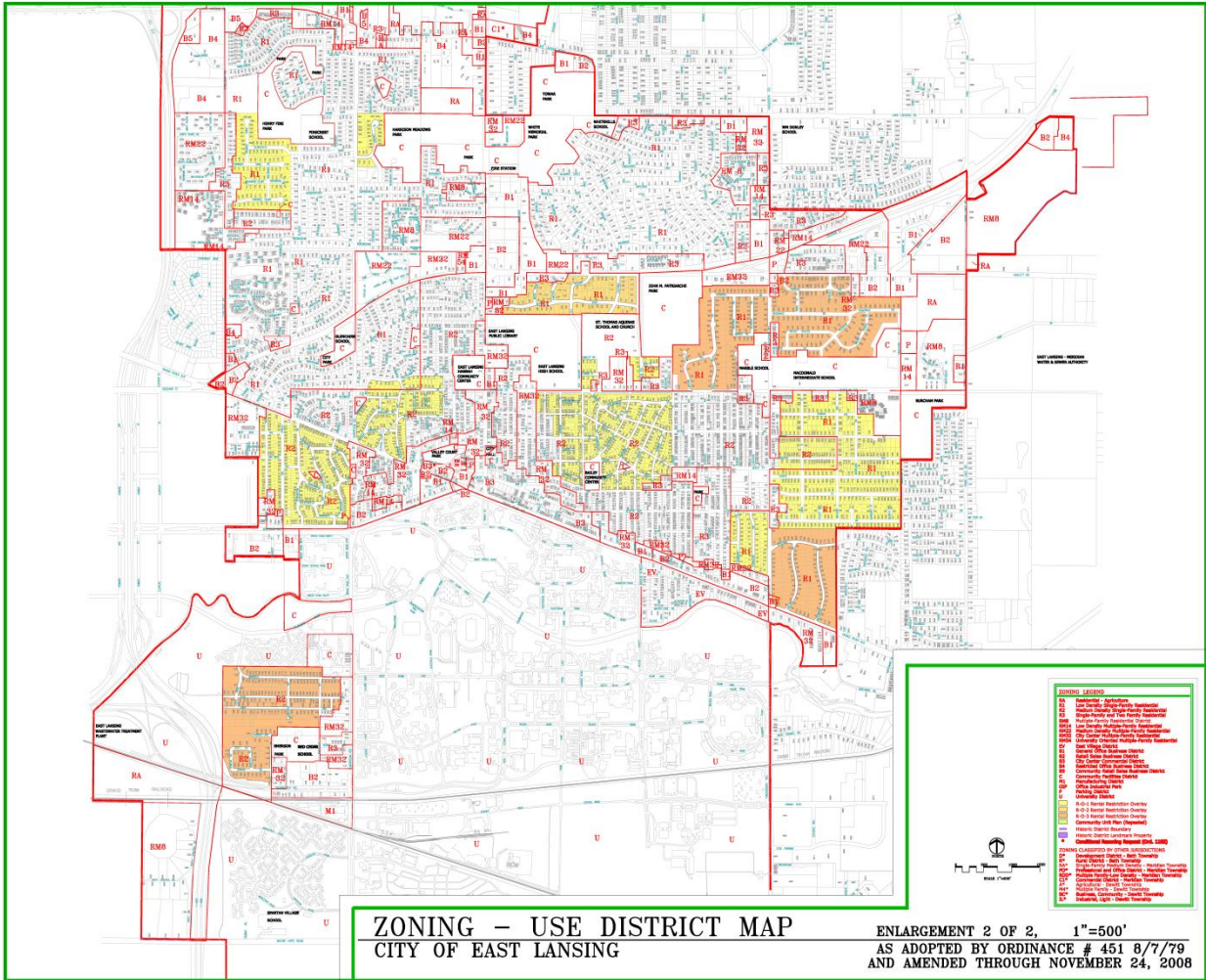


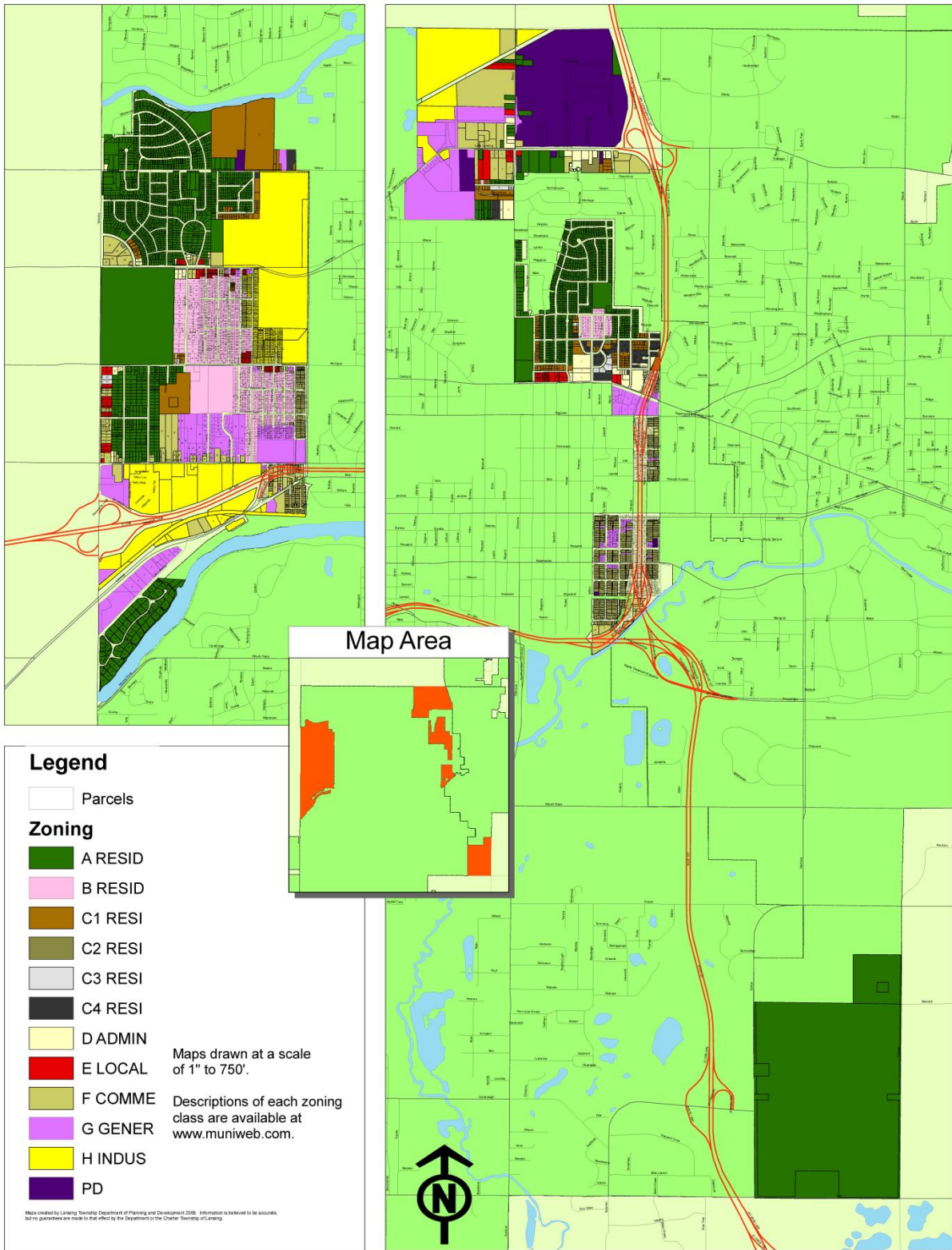
Delta Township/City of Lansing
PA 425 District
June, 2025



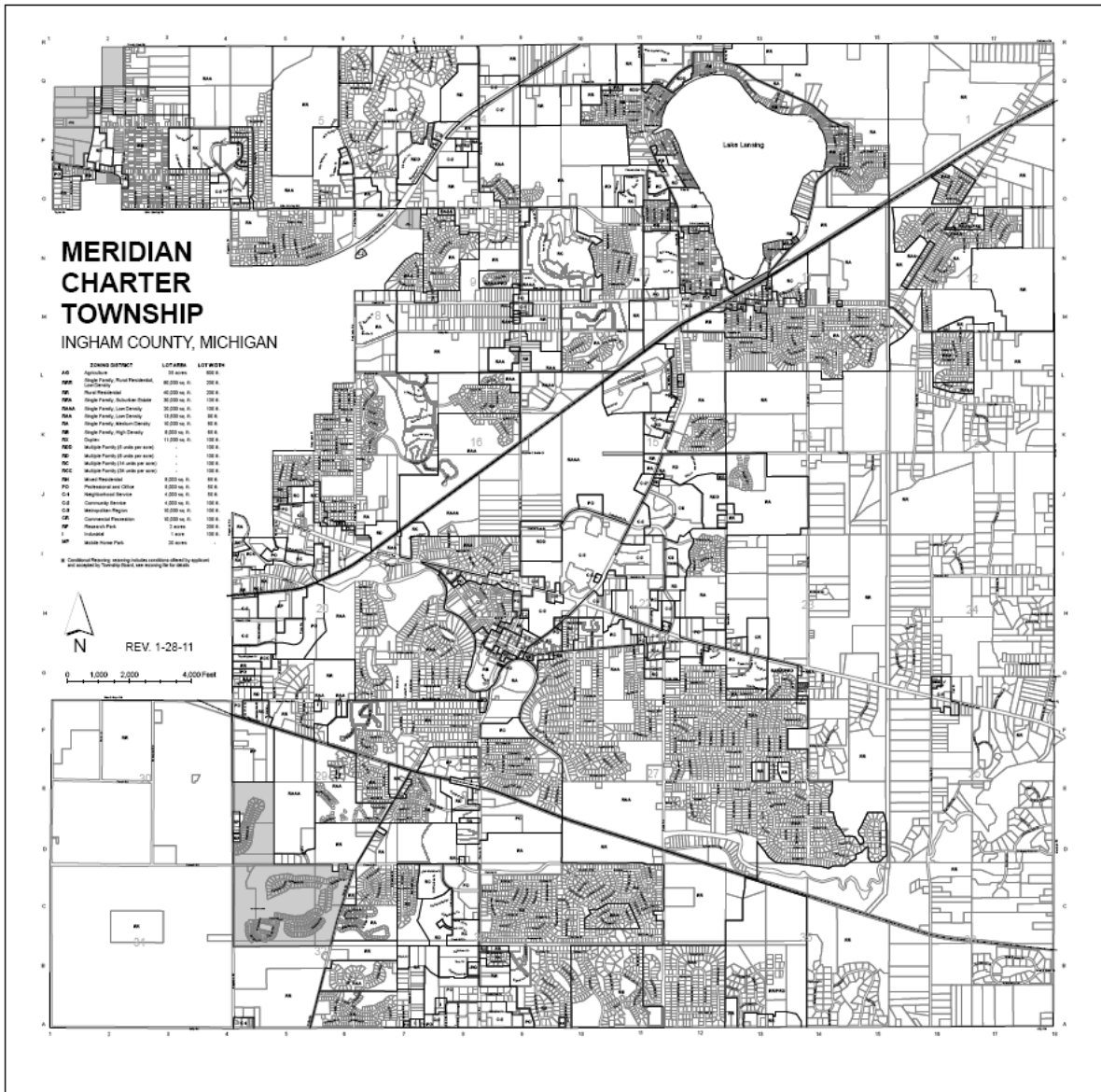
EFFECTIVE DATE: 12/14/1990
LATEST REVISION DATE: 01/15/2009

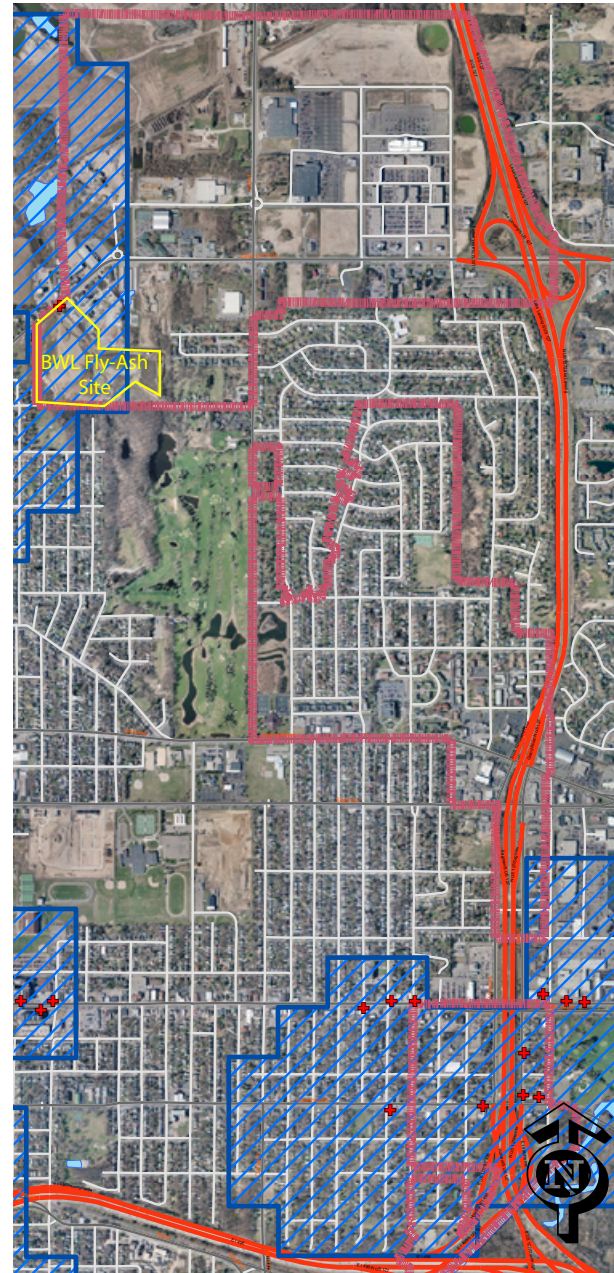
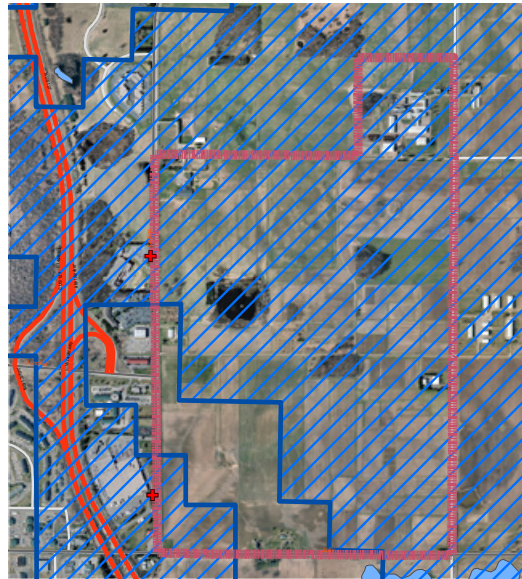






ZONING MAP





Masterplan 2009
 Map 13
 Lansing Township
 Contaminated Sites

Legend

-  Highways
-  Township boundary
-  Major roads
-  Surface Bodies of Water
-  Leaking Underground Storage Tank
-  Wellhead Protection Area
-  Leaking Underground Storage Tank in Wellhead Protection Area

Map source: State of Michigan LUST database and TCRPC; map produced by the Charter Township of Lansing Department of Planning + Development, 2009.



APPENDIX V: INTERVIEWS

Interview Results from:

Planning Department Representatives from the Tri-County Area

Interview Date: February 7, 2011

In Attendance: Jon Benaderet, Gary Bozek, Matt Brinkley, Rick Brown, Erin Campbell, Kellie Green, Tyler Klifman, Cheryl Loudon, Bill Maier, Tracy Miller, John Pickering, Tim Schmitt, Christine Sptizley, Ryan Soucy and Yue Zhang.

Details: This interview involved a collective panel discussion with the representatives in attendance and was then followed-up with individual interviews with each of the planners separately. No representative from the City of Lansing was able to attend. Also, the interview with representatives from Meridian Charter Township and the City of East Lansing were done together. Meanwhile, some of the questions are standard while some differ depending on conversation flow and inquiry.

In a meeting with representatives from East Lansing, Lansing Township, Meridian Township, Delta Township, Delhi Township and the Lansing Board of Water and Light, issues related to wellhead protection were discussed. The meeting was coordinated by the Tri-County Regional Planning Commission's Environmental Programs Planner, and the group answered a series of questions collectively, followed by location-specific one-on-one interviews. The results of these interviews are transcribed, beginning on page 85 of this document. Representatives from the city of Lansing were absent from the meeting, although they are a part of the study and constitute a significant portion of the region's population.

Each separate municipality creates and manages its own wellhead protection plan; however, the groundwater they are regulating is a shared resource for the region. In an effort for the communities to work together and engage in a regional strategy to protect this resource, the Tri-County Regional Planning Commission (TCRPC) oversees the Groundwater Management Board (GMB). The GMB is funded through dues paid to TCRPC based on a participating community's population. They discuss policy regulations and are the primary enforcement of such policy. Given the proximity of some of the communities, a regional strategy is achieved through collaborative documents. East Lansing and Meridian Township, for example, operate with a joint wellhead protection plan. Still, there are weaknesses in working regionally, and from the discussion between planning department representatives, they are rooted in failures to communicate. The most commonly cited weakness in their local regulations was in their access to current data. It is necessary to have the most up-to-date information for the most effective management and regulation, however, TCRPC assists in providing this information and many officials were simply unaware.

With a high rate of turnover for elected officials, the representatives from the planning staffs agree that it is difficult to maintain effective shared management of wellhead protection responsibilities within their individual communities. Ensuring that the officials are receptive to groundwater ordinances requires that they are aware of the issues at hand. It becomes an effort of the permanent staff to keep them updated on how wellheads are regulated and why it is important. The receptiveness of the elected officials determines the strength of the ordinance, so it takes a collaborative effort between not only the different communities in the region, but representatives within a community as well.

In regard to the best management practices related to wellhead protection, the different communities use varying levels of environmental oversight and involvement. Their major concerns are the same—closing abandoned wells to prevent contamination—and although there have been statewide efforts that offered assistance; the representatives were in agreement that they were largely ineffective. Closing wells has the potential to be extremely costly; however, if they remain open, the risk of polluting the groundwater threatens to impose even higher clean-up costs. In Delta Township, the average cost of well-capping is roughly \$700-\$800, and they are able to offer assistance by covering half of the cost, up to \$600. Because this still leaves a significant financial burden on homeowners in the tri-county area, and the potential for a water source, many are still reluctant to close wells on their property, but in Delhi Township, they are not allowed to tap public water until they can prove any abandoned wells on the property are closed. Meridian Township asks applicants to report any abandoned wells as a part of their site-plan review process and their approval is contingent on the well being capped. The varied management practices yield varied results, and the Board of Water and Light finds that these regulations are often difficult to enforce, with many area residents having access to both private and public wells.

As funding for wellhead protection efforts becomes increasingly scarce, the representatives are hopeful that the way TCRPC has integrated their efforts into many different programs will ensure their existence. Raising awareness through the annual Children's Water Festival, advertisements in local movie theaters, delineating Wellhead Protection Areas with signage and more, the goal is that the issues will be important enough to citizens and politicians that they support them and campaign for them. Given the value of ensuring safe and protected drinking water, the representatives agree that support for wellhead protection programs will continue even with an uncertain economic situation.

Interview Results:

Delhi Charter Township

Interview Date: February 7, 2011

Interview Subject: Tracy L.C. Miller, AICP, *Director of Community Development*, Charter Township of Delhi

Details: This is a follow-up individual interview to the *Planning Department Representatives from the Tri-County Area Interview*.

What are the possible changes for the community in future water demands? Are there any plans for water supply emergencies?

“Providing one of the most basic necessities has never been more challenging than it is today. Exploding and shifting populations, meteorological changes, and greater environmental and security regulations place demands upon every point in the water cycle—from watersheds, through conveyance, treatment, distribution, and collection. Most of statics work has been done by Lansing Board of Water and Light every year. And they also take charge of the contingency plan of water supply.”

Who will pay for the initial acquisition and installation of the system as well as maintenance responsibilities?

“Successful financial management balances the funding necessary to provide an effective implementation of wellhead protection. The majority of funds come from the state grant and local businesses are also integrated in the process. Further adoption of ordinance amendments will be taken to address the problem of tight money. We also get money from tax. The customer pays for the development and operation of the water system. If money is borrowed to improve or extend water service, a plan must be in place to assess system users to pay back these obligations.”

What sort of community awareness/education or public outreach programs have you engaged in? What degree of success did these programs see?

“We do engage in various public participation programs. Citizens are more likely to concern about ‘Green’ rather than wellhead protection. Therefore, we host series of activities, such as celebration, movies, education at school, brochures and flyers.”

Interview Results:

Delta Charter Township

Interview Date: February 7, 2011

Interview Subject: Gary Bozek, AICP, *Senior Planner*, Delta Charter Township

Details: This is a follow-up individual interview to the *Planning Department Representatives from the Tri-County Area Interview*.

Delta Township's wellhead protection plan was last updated in 2007. While it is recommended that the plan is updated every 3-4 years, they have no plans to do so in the immediate future because they are currently working to revise their comprehensive plan. When the plan is updated, the utility department will be responsible for wellhead regulations, and currently they rely heavily on management from the Tri-County Regional Planning Commission.

Does your community have any programs in place for the identification and deconstruction of abandoned wells?

Environmental oversight for closing wells comes from the utility department and the engineering division for Eaton County.

How has your community's water needs changed?

-Future projections?

The township's population has increased by 3,000 between the last two censuses. There are currently up to 70 new homes being built per year, and all new subdivisions are required to use public utilities from the Lansing Board of Water and Light.

Are there any sites that could be a major contributor to non-point source pollution?

Potential sites for non-point-source pollution include a large acreage of agricultural land that is difficult to control through this type of regulation.

Regarding goals in the existing comprehensive plan:

"...the adoption/ enforcement of zoning regulations and providing monetary assistance in the plugging of abandoned wells (Delta Township Comprehensive Plan, 2004 pg.70)."

-Regulations exist in freestanding ordinances separate from the zoning regulations. They do not require that a well be plugged, but that if public water is available, it must be used as opposed to an existing well on the property.

-Financial assistance is available for half of the cost of plugging a well, up to \$600.

"...consider the adoption of zoning ordinance amendments that would limit the amount of impervious surfaces in commercial developments (Delta Township Comprehensive Plan, 2004 pg.94)."

-This topic is still under consideration but has yet to be implemented. It would rely on regulation from the drain commissioner's office.

"...consider a limit on the maximum number of parking spaces above the minimum that can be provided on a site ((Delta Township Comprehensive Plan, 2004 pg. 94)."

-The Eaton County Road Commission would contribute to this, but have so far not been willing to do so because of the costs involved and an "older mentality."

Interview Results:

East Lansing and Meridian Charter Township

Interview Date: February 7, 2011

Interview Subjects: Richard F. Brown, AICP, *Associate Planner*, Meridian Charter Township, and Timothy Schmitt, AICP, *Community Development Analyst*, City of East Lansing

Details: This is a follow-up individual interview to the *Planning Department Representatives from the Tri-County Area Interview*.

Both the city of East Lansing and Meridian Township share a single plan devoted to the protection of their wellheads and groundwater. Public Works have created a Wellhead Protection Plan in 2000 for these neighboring communities and they regularly update it every 3 years to meet the changing needs of the communities. The main problem the City of East Lansing is confronted with is the lack of information regarding the location and types of wells. Funds that used to be allocated to help facilitate this process have since been cut, but the community is slowly making progress to plug all abandoned wells.

Does your community have any programs in place for the identification and deconstruction of abandoned wells?

The most pertinent solution is requiring an evaluation for all remodeling and new constructions through their respective planning departments. This evaluation requires the property owner to report any private wellheads and potential contaminations. If the site has an existing wellhead, it must be plugged before any further construction can continue. However, if there is a contamination, as determined by the Land Use Application which asks if “delineation of areas on the site which are known or suspected to be environmentally contaminated, together with a report on the status of cleanup or closure”, the site must be cleaned up and monitored more closely in future. This process can be very costly, but if determined as a Brownfield, the state may provide funds to help facilitate the cleanup.

With little funding available, are there any incentives to property owners to report and dismantle their private wellheads?

Although it is not strictly enforced to report private wellheads and sources of pollution, many businesses are complying with the communities because they do want the liability. Homeowners are more likely to use these private wells for irrigation for their gardens and not report them.

What is the likelihood that your community’s legislative bodies would reevaluate your groundwater protection programs as per our recommendations?

Given if the recommendations made by the practicum team are made within the year 2011, provide accurate information and require little funds to enact, the assessment should be used.

Has there ever been a significant threat to groundwater safety in your community? If so, what was the response?

Fortunately for both communities neither has experienced any major contaminations to their groundwater safety. If such a catastrophe were to occur, it would be difficult to predict the outcome due to many varying factors. However, the most likely scenario of a significant threat would be a freight or a semi-truck spill in the area. If this were to occur, it would a problem solved by the Public Works Commission. A more common worry among both planners, are residents, because they are not monitored for their activities and may not understand the impacts to groundwater that their actions may yield.

Are there any potential sources of pollution or Brownfields that could contaminate the groundwater?

Thanks in part to their zoning amendments; both communities have relatively little risks of major sources of pollution. Both sites have few industrial parcels and many common sources of pollution such as gas stations and laundry mats are being watched to monitor their contamination rates in the soil. Commercial and industrial developments have hazard mitigation plans in place that serve to protect against any potential contaminations.

Approximately how many wells are located between your communities?

There are over 2,000 including private, abandoned and public wells. However, the exact number is unknown, due to the lack of solid information and amount of resources and money it would require to gather this information.

Additional notes:

- A Phase 1 Environmental Assessment may be a condition to be met before beginning construction for areas that are suspected of being polluted or having the potential to pollute
- Emergency plans for spills due to train derailment could possibly be found with the railway company (CN) or the public works department
- Banks typically require abandoned wells to be plugged as a condition for a loan or mortgage; abandoned wells are seen as a liability
- No regulations exist for the amortization of irrigation wells for sites tapping into the public water supply. A regulation such as this may be unpopular in Meridian, but have more support in East Lansing

Interview Results:

Lansing Charter Township

Interview Date: February 7, 2011

Interview Subject: Matt Brinkley, AICP, *Senior Planner*, Lansing Charter Township

Details: This is a follow-up individual interview to the *Planning Department Representatives from the Tri-County Area Interview*.

Describe any environmental oversight for closing wells

-Is there any record of closed/abandoned wells in place?

Mr. Brinkley responded that the environmental oversight really included the point of sale ordinance. He also stressed the oversight of the Ingham County Health Department as involved in private well mitigation. They also have the records of closed/abandoned wells currently in the township. The Ingham County Health Department works with the Bureau of Environmental Health, which is mandated by the Michigan Public Health Code in establishing well permit programs, standards for site selection, isolation from contamination, construction technique, and groundwater monitoring around potential and actual pollution sites (Ingham County Health Department, "Well and Septic").

How has your community's water needs changed?

-Future projections?

Mr. Brinkley responded that Lansing Township has had a mild population loss, but ultimately has remained fairly stable due to the fact that it is mostly urbanized and built up. Therefore, new construction for housing is rare if at all. Mr. Brinkley claimed they had lost approximately 1,000 people from the last census. After reviewing the U.S. Census Bureau, I found that they had only lost about 500 persons (8,458 in 2000; 7,967 in 2005-2009). He said that the water needs have not changed with unsubstantial population decline. He expects future projections to remain stable as well.

What sort of community awareness/education or public outreach programs have you engaged in? What degree of success did these programs see?

*This question was discussed aside from the interview question list

Mr. Brinkley discussed the success of the Children's Water Festival described in the general panel discussion. Similarly, Lansing Township has signs throughout the community reading: "You have now entered a wellhead protection area". Also, there is an "Edible Water" seminar where children are educated on water quality and pollution. Similarly, at the science center there is a detailed groundwater recharge model.

How do you handle wellhead protection differently since your township is separated into five noncontiguous sections?

Mr. Brinkley said there is no difference to analyzing wellhead protection since the water source/aquifer is the same for the tri-county area. The township handles wellhead protection planning the same as if it were not divided into noncontiguous sections. They employ policy in their zoning and site plan ordinances.

Are there any difficulties working with two different public water suppliers, Lansing Board of Water and Light as well as Westside Water?

Mr. Brinkley described that the two suppliers work together anyhow. Therefore, it is an easy process. Lansing Board of Water and Light filtrates all of the water that Westside Water purchases. He said both parties are very receptive to one another.

Who is involved in managing wellhead protection for your township?

The fire department plays a critical role. They are the first responders and deal with day-to-day water protection. The health department is also involved for sanitation purposes. Also, Mr. Brinkley stressed the idea of state regulations through the MDEQ as well as the EPA. He said since this is where funding comes from, they have the power. He described that there is insufficient communication across managing entities as it's difficult to get everyone on the same page.

How big of a concern is wellhead protection for your township? What are the largest threats?

Wellhead protection is an important issue that affects all community members. Mr. Brinkley described that both Lansing and Lansing Township have many legacy sites that need to be looked at (Some of these areas are delineated in the master plan p. 59, Map 13: "Lansing Township Contaminated Sites"). Both municipalities have an industrial history with many contaminated sites located within the areas. Mr. Brinkley stressed the importance of managing these sites as well as clean-up efforts. He discussed the old GM site as a threat to groundwater. However, there are various clean-up efforts here. He also discussed the recent fire at a chrome plating factory and its possible threat to groundwater. The effects of these events are hard to test now, but they do leave damaging results later when completing water testing.

Additional comments:

Mr. Brinkley described that that there are no new wells allowed to be drilled in Lansing Township. Also, that all new development requires municipal water and sewer to ensure oversight and safety. Another side note was his comment on very strict demolition regulations. He said the township's were perhaps the most stringent in the state. This is located in the Code of Ordinance manual, Chapter 109: Demolition of Building and Structures. There is a lot of environmental oversight located here especially as water is concerned.

Interview Results from:

Mark Wyckoff

Date interviewed: January 28th, 2011

In Attendance: Mark Wyckoff, John Pickering, Kellie Green, Yue Zhang, Tyler Klifman, Ryan Soucy and Christine Spitzley

Mark Wyckoff is the current Director at the Planning & Zoning Center at Michigan State University and the Senior Associate Director at the MSU Land Policy Institute. In 1991, Mark wrote and published the Community Planning & Zoning for Groundwater Protection in Michigan with the purpose of educating local officials of the importance of groundwater protection and the best options to protect this valuable resource. Twenty years later, our practicum group had the opportunity to interview Mark to ask him his thoughts about how the book now applied to today's current issues surrounding groundwater protection.

The biggest change since the book was first distributed was the changes and updates in national and state laws. Since published, many state and federal guidelines (see index for regulations) have been altered to fit community's issues with pollution and water quality. Many new potential pollutants have been created and used and therefore, new regulations have been created to counteract the effects of these contaminants. With new regulations, new measures for judging an effective groundwater protection plan have also been adopted. The subjective definition of water quality over the years has led to a greater quantity and more intensive tests to determine this factor depending on each community's ordinances and master plans.

However, not all the communities have implemented the standards recommended by Mr. Wyckoff, whether due to financial constraints, being understaffed or a combination of the two. Another difficulty that arises when monitoring groundwater quality is the fact that it is difficult to measure. Due to the long time frames it requires for contaminations to occur, constant and dedicated measurements must be consistently administered.

Appendix VI:

BEST MANAGEMENT PRACTICES

Best management practices are often utilized for alleviating and preventing against environmental threats. There are different best management practices for different environmental issues accordingly. Best management practices for improving water quality are mentioned in federal regulations including: the United States Clean Water Act (1977) as well in state documents like “Michigan’s Nonpoint Pollution Control Management Plan” (1988) (Peterson, Reznick, Hedin, Hendges, Dunlap). Best management practices can often be infused in local policy to ensure that they are incorporated.

A qualitative research approach was taken in identifying best management practices for wellhead protection planning. It is difficult to measure the success rate of utilizing best management practices; therefore quantitative research on this topic is rare. However, there are many implied benefits since it is difficult to argue against employing these methods.

Two of the procedures used in this investigation of best management practices include: face-to-face interviews and review of archival documentation.

1. Face-to-face interviews

Interviews with the members of the TCRPC wellhead planning board were completed where data collection on these management practices were identified (for more information review Appendix III). Similarly, Mark Wyckoff also assisted with information on best management practices through correspondences.

2. Review of archival documentation

Research was completed in identifying these best management practices by investigating various federal, state, and local examples. The Capital Area Groundwater Alliance website contained comprehensive information that was evaluated as well.

Here is a list of best management practices commonly associated with wellhead protection:

Pesticide and Fertilizer Administration

The use of pesticides and fertilizers pose a threat to groundwater resources due to toxicity from spillage and integration. Many of these land management products contain hazardous chemicals when not applied appropriately. It is important to pay attention to application instructions, for instance, they should not be applied before a rainfall. Similarly, these management products must be contained, disposed and transported properly to ensure that spillage does not occur.

Abandoned Well Management

Abandoned wells are a direct threat to our drinking water if contaminants reach recharge areas. Private wells need to be properly maintained and tested to ensure safety and sanitation. If not, they should be appropriately capped or plugged by a coordinating technician. The health department or local municipality can usually assist with abandoned well management.

Waste Reduction and Management

Waste is often harmful to groundwater. It is difficult to know where groundwater recharge areas lie above the surface; therefore it is important to properly contain waste as to protect contaminants from seeping into our drinking water supply. Also, using less environmentally hazardous products can help reduce groundwater contamination. It is also encouraged to keep/order chemicals and potentially toxic materials on an as need basis to avoid the likelihood of spills.

Power Washing

Runoff of water as an effect of cleaning a surface or object can oftentimes be a threat to the public water supply system. It is recommended to wash cars and equipment in proper areas, where drains are connected to proper sanitary sewer systems, do not allow runoff water to enter storm sewers or recharge areas. Oftentimes surfaces such as cars contain contaminants like oil, paint, and salt which are harmful for maintaining public infrastructure and threatening to water quality.

Water Conservation

It is encouraged that only as much water that is necessary is used. Public sewer and septic systems can be in danger from overuse. Similarly, water is a non-renewable resource that needs to be conserved for future generations and treated as so.

Know Your Property

It is important to understand your property including: soil types, geology, and climate. Also, it is important to understand where to discharge potential contaminants as well as locations and uses of drains or sewers and waste disposal. This will help ensure that land use practices are preformed sustainably and with low impact to the surrounding environment as well as to groundwater resources.

ENVIRONMENTAL PERMITS CHECKLI
Developed by Tri-County Regional Planning
(Shared by Delhi Township, Delta Township, City of Lansing and Lansing Township)

Name of Business: _____

Mailing Address: _____

Telephone: _____ Fax: _____

Type of Business: _____

Facility Owner or Manager: _____

Date: _____ Signature: _____

Note: For assistance with permits and approvals from the Michigan Department of Environmental Quality, including permit coordination among MDEQ divisions, contact the Permit Coordinator, 517/335-4235.

Circle (Y/N) the items that may pertain to your project or facility; then contact the office(s) listed to determine specific requirements. Return a copy of this checklist to the municipality as part of your site plan submittal – even if state and county approvals have not yet been obtained. An updated copy should be submitted prior to occupancy.

This list includes the most common permits and approvals related to waste, water quality, and air quality. Other permits and approvals, including local approvals, may also be needed.

1. Y N Will the project involve the discharge of any type of wastewater to a storm sewer, drain, lake, stream, wetland or other surface water? **Contact: MI Dept. of Environmental Quality, Surface Water Quality Division, Permits Section: 517/373-8088.**
2. Y N Will the project involve the direct or indirect discharge of waste, waste effluent, wastewater, pollutants, and/or cooling water into the groundwater or on the ground? **Contact: MI Dept. of Environmental Quality, Waste Management Division, Groundwater Program Section: 517/373-8148.**
3. Y N Will the project involve construction or alteration of any sewage collection or treatment facility? **For facilities discharging to surface waters, contact the MI Dept. of Environmental Quality, Surface Water Quality Division, District Office: 517/625-4647. For facilities discharging to groundwater, contact the MI Dept. of Environmental Quality, Waste Management Division, District Office: 517/625-5515.**
4. Y N Will the project or facility store or use chemicals, petroleum products, or salt? Depending on the type of substance, secondary containment and a Pollution Incident Prevention Plan (PIPP) may be required. **Contact: MI Dept. of Environmental Quality, Waste Management Division, District Office: 517/625-5515.**
5. Y N Will the project involve the installation, operation, or removal of an underground or aboveground storage tank containing a petroleum product or a hazardous substance? **Contact: MI Dept. of Environmental Quality, Storage Tank Division: 517/373-8168.**
6. Y N Will the project involve liquefied petroleum gas storage tanks or container filling locations? **Contact: MI Dept. of Environmental Quality, Storage Tank Division: 517/373-8168.**
7. Y N Does the project involve the installation of a compressed natural gas dispensing station with storage? **Contact: MI Dept. of Environmental Quality, Storage Tank Division: 517/373-8168.**
8. Y N Does the project involve the generation of hazardous waste? **Contact: MI Dept. of Environmental Quality, Waste Management Division, District Office: 517/625-5515.**
9. Y N Will the project involve the on-site treatment, storage or disposal of hazardous waste? **Contact: MI Dept. of Environmental Quality, Waste Management Division, Hazardous Waste Permit Unit: 517/373-9875.**

-
10. Y N Will the project involve the transport of hazardous waste or non-hazardous liquid industrial waste? **Contact:** MI Dept. of Environmental Quality, Hazardous Waste Program Section: 517/373-9875.
11. Y N Will the project involve landfilling, transferring or processing solid non-hazardous wastes on-site? **Contact:** MI Dept. of Environmental Quality, Waste Management Division, District Office: 517/625-5515.
12. Y N Will the project involve the installation, construction, reconstruction, relocation, or alternation of any process or process equipment (including air pollution control equipment) which has the potential to emit air contaminants? **Contact:** MI Dept. of Environmental Quality, Air Quality Division, Permit Section: 517/373-7023.
13. Y N Will the project or facility involve the storage, mixing or distribution of pesticides or fertilizers in bulk quantities? **Contact:** MI Dept. of Agriculture, Pesticide and Plan Pest Management Division: 517/373-1087.
14. Y N Will the project involve any man-made change in the natural cover or topography of land, including cut and fill activities which may contribute to soil erosion and sedimentation? Will the earth change disturb an area of one acre or more, or occur within 500 feet of a lake or stream? If the answer to both of these questions is yes, a soil erosion and sedimentation control permit is required. **Contact:** Ingham County Drain Commissioner at 517/676-8395 for all communities in Ingham County. In addition, a permit may be required from the DEQ. **Contact:** MI Dept. of Environmental Quality, Land & Water Management Division, Soil Erosion & Sedimentation: 517/373-3178.
15. Y N Will the project involve dredging, filling, or construction in, across or under (1) a river, stream, creek, ditch, drain, lake, pond or swamp? (2) wetlands? (3) floodplain (area that may have or ever had either standing or flowing water)? **Contact:** MI Dept. of Environmental Quality, Land & Water Management Division, Permit Consolidation Unit: 517/373-9244.
16. Y N Will the project involve any dredging proposed within 500 feet of a lake, river, stream, creek or ditch? **Contact:** MI Dept. of Environmental Quality, Land & Water Management Division, Permit Consolidation Unit: 517/373-9244.
17. Y N Will an on-site wastewater treatment system or septic system be installed?

For subsurface sanitary sewage disposal in quantities of 10,000 gallons per day or less: Ingham County Health Dept., Environmental Health Division: 517/887-4312. For any subsurface discharge of sanitary sewage in quantities equal to or greater than 10,000 gallons per day – **Contact:** MI Dept. of Environmental Quality, Waste Management Division: 517/373-8148.

For subsurface disposal of sanitary sewage in quantities of 6,000 to 10,000 gallons per day: In addition to obtaining a construction permit from the Ingham County Health Department, submit a state wastewater discharge notification form. Flow monitoring and reporting are required – **Contact:** MI Dept. of Environmental Quality, Waste Management Division, Groundwater Permits Unit: 517/373-8148.

For industrial or commercial wastewater (other than sanitary sewage) in any quantity – **Contact:** MI Dept. of Environmental Quality, Waste Management Division, Groundwater Permits Unit: 517/373-8148.

18. Y N Will the project involve the construction of a water supply well or the extension of a water supply service from an existing water system? **Contact:** MI Dept. of Environmental Quality, Drinking Water Program, District Office: 517/625-5515; and Ingham County Health Dept., Environmental Health Division: 517/887-4312.
19. Y N Are there out-of-service wells, abandoned wells, or cisterns on the site (drinking water, irrigation, & monitoring wells)? **Contact:** Ingham County Health Dept., Environmental Health Division: 517/887-4312.
20. Y N Will the project involve a subdivision or site condominium project utilizing individual on-site subsurface disposal systems or individual wells? **Contact:** Ingham County Health Dept., Environmental Health Division: 517/887-4312.
21. Y N Will the project involve the on-site storage of sanitary sewage prior to transport and disposal off-site (pump and haul)? **Contact:** MI Dept. of Environmental Quality, Waste Management Division, Groundwater Program Section: 517/373-8148.

22. Y N Has the property or facility ever been subject to a remedial action, limited closure, or other environmental cleanup response under Part 201, Natural Resources and Environmental Protection Act (NREPA)? Is the property currently subject to a response action? Has a Baseline Environmental Assessment (BEA) been completed for the property?
Contact: *MI Dept. of Environmental Quality, Environmental Response Division: 517/373-9893 and/or MI Dept. of Environmental Quality, Storage Tank Division: 517/373-8168.*

NOTE: The general telephone number for the Shiawassee DEQ District office (which covers Ingham, Eaton, and Clinton counties, among others) is 517/625-5515. The office is located at 10650 Bennett Drive, Morrice, MI 48857-9792. The fax number is 517/625-5000.

**CITY OF EAST LANSING
ENVIRONMENTAL PERMITS CHECKLIST**

Property Address: _____

Parcel ID(s): _____

Property Owner: _____

(Or its legal representative)

Mailing Address: _____

Office/Cell/Fax: _____

E-mail Address: _____

Applicant: _____

(If not property owner)

Mailing Address: _____

Office/Cell/Fax No(s): _____

E-mail Address: _____

Signature: _____ Date: _____

Instructions: Circle (Y/N) the items that may pertain to your project or facility; then contact the office(s) listed to determine specific requirements. Return a copy of this checklist to the Department of Planning & Community Development as part of your project or development submittal – even if the approvals have not yet been obtained. This list includes the most common permits and approvals related to waster, water quality, and air quality. Other permits and approvals, including City approvals may also be necessary.

1. Y N Will the project involve the discharge of any type of wastewater to a storm sewer, drain, lake, wetland, or other surface water? Contact: MDEQ/Water Bureau @ (517) 335-4176.
2. Y N Will the project involve the direct or indirect discharge of waste, waste effluent, wastewater, pollutants, and/or cooling water into the groundwater or on the ground? Contact: MDEQ/Waste & Hazardous Materials Division @ (517) 335-2690.
3. Y N Will the project involve construction or alteration of any sewage collection or treatment facility? Contact: MDEQ/Water Bureau @ (517) 335-4176. For facilities discharging to surface waters, Contact: MDEQ/Water Division @ (517) 335-4176. For facilities discharging to groundwater, Contact: MDEQ/Waste & Hazardous Materials Division @ (517) 335-2690.
4. Y N Will the project or facility store or use chemicals, petroleum products, or salt? Depending on the type of substance, secondary containment and a Pollution Incident

Prevention Plan (PIPP) may be required. Contact: MDEQ/Waste & Hazardous Materials Division @ (517) 335-2690 and Ingham County Health Department/ Environmental Health Division @ (517) 887-4312.

5. Y N Will the project involve the installation, operation, or removal of an underground or above ground storage tank containing a petroleum product or hazardous substance? Contact: MDEQ/Waste & Hazardous Materials Division @ (517) 335-2690.
6. Y N Will the project involve liquefied petroleum gas storage tanks or container filling stations? Contact: MDEQ/Waste & Hazardous Materials Division @ (517) 335-2690.
7. Y N Does the project involve the installation of a compressed natural gas dispensing station with storage? Contact: MDEQ/Waste & Hazardous Materials Division @ (517) 335-2690.
8. Y N Will the project involve the generation of hazardous waste? Contact: MDEQ/Waste & Hazardous Materials Division @ (517) 335-2690.
9. Y N Will the project involve the on-site treatment, storage, or disposal of hazardous waste? Contact: MDEQ/Waster & Hazardous Materials Division @ (517) 335-2690.
1. Y N Will the project involves the transport of hazardous waste or non-hazardous liquid industrial waste? Contact: MDEQ/Waste & Hazardous Materials Division @ (517) 335-2690.
2. Y N Will the project involves landfilling, transferring or processing solid non-hazardous wastes on site? Contact: MDEQ/Waste & Hazardous Materials Division @ (517) 335-2690.
3. Y N Will the project involve the installation, construction, reconstruction, relocation, or alteration of any process or process equipment (including air pollution control equipment) which has the potential to emit air contaminants? Contact: MDEQ/Air Quality Division @ (517) 373-7023.
4. Y N Will the project or facility involves the storage, mixing, or distribution of pesticides or fertilizers in bulk quantities? Contact: Michigan Department of Agriculture/Region 6 Pesticide & Plant Pest Management Division @ (517) 335-1830.
5. Y N Will the project involves a manmade change in the natural cover (land clearing) and/or topography of land, such as cut/fill activities that may contribute to soil erosion/sedimentation? Contact: Ingham County Drain Commissioner @ (517) 676-8395; City of East Lansing Engineering Department @ (517) 337-9459; and MDEQ/Land & Water Management Division @ (517) 373-1170.
6. Y N Will the project involve dredging, filling, or construction in, across, or under a river, stream, creek, ditch, drain, lake, pond, swamp, wetland(s), or floodplain? Contact: MDEQ/Land & Water Management Division @ (517) 373-1170; City of East Lansing Engineering Department @ (517) 337-9459; and Federal Emergency Management Agency @ (800) FEMA-MAP.
7. Y N Will the project involves any dredging proposed within 500 feet of a lake, river, stream, creek, or ditch? Contact: MDEQ/Land & Water Management Division @ (517) 373-1170.
8. Y N Will an on-site wastewater treatment system or septic system be installed?
 - For subsurface sanitary sewage disposal in quantities equal to or greater than 10,000 gallons per day. Contact: MDEQ/Waste & Hazardous Materials Division @ (517) 335-2690.
 - For subsurface disposal of sanitary sewage in quantities of 6,000 to 10,000 gallons per day: In addition to obtaining a construction permit from the Ingham County Health Department, submit a state wastewater discharge notification form.

Flow monitoring and reporting are required. Contact: MDEQ/Waste & Hazardous Materials Division @ (517) 335-2690.

For industrial or commercial wastewater (other than sanitary sewage) in any quantity. Contact: MDEQ/Waste & Hazardous Materials Division @ (517) 335-2690.

9. Y N Will the project involve construction of a water supply well or extension of a water supply service from an existing water system? Contact: MDEQ/Water Bureau @ (517) 335-4176.
10. Y N Are there out-of-service wells, abandoned wells, or cisterns on the site? (drinking water, irrigation & monitoring wells). Contact: MDEQ/Water Bureau @ (517) 335-4176; Ingham County Health Department/Environmental Health Division @ (517) 887-4312; and City of East Lansing Engineering Department @ (517) 337-9459.
11. Y N Will the project involve a subdivision or site condominium project utilizing individual on-site subsurface disposal systems or individual wells? Contact: Ingham County Health Department/Environmental Health Division @ (517) 887-4312.
12. Y N Will the project involve the on-site storage of sanitary sewage prior to transport and disposal off-site (pump and haul)? Contact: MDEQ/Waste & Hazardous Materials Division @ (517) 335-2690.
13. Y N Has the site/facility ever been subject to a remedial action, limited closure, or other environmental cleanup response under Part 201, Natural Resources and Environmental Protection Act (NREPA)? Is the property currently subject to a response action? Has a Baseline Environmental Assessment (BEA) been completed for the property? Contact: MDEQ/Remediation & Redevelopment Division @ (517) 373-9837 and/or MDEQ/Waste & Hazardous Materials Division @ (517) 335-2690.
14. Y N Will the project involve the installation of a seawall or bulkhead? Contact: MDEQ/Land & Water Management Division @ (517) 373-1170 and City of East Lansing Engineering Department @ (517) 337-9459.

Notes:

- a. For assistance with permits and approvals from the Michigan Department of Environmental Quality (MDEQ), including coordination among MDEQ divisions, contact the Permit Coordination Unit at (517) 373-1323.
- b. For assistance on environmental issues at the MDEQ, contact the Environmental Assistance Center at (800) 662-9278
- c. For Spill/Release Reporting to the MDEQ, call (517) 373-8481.
- d. For pollution emergencies, call the MDEQ at (800) 292-4706 in Michigan and (517) 373-7660 outside of Michigan.

**CHARTER TOWNSHIP OF MERIDIAN
ENVIRONMENTAL PERMITS CHECKLIST**

Name: _____
Mailing Address: _____
Telephone: _____ Fax: _____ E-Mail: _____
Type of Business (if applicable): _____
Owner/Manager: _____
Date: _____ Signature: _____

Circle (Y/N) the items that may pertain to your project or facility; then contact the office(s) listed to determine specific requirements. Return a copy of this checklist to the Department of Community Planning & Development as part of your project or development submittal – even if the approvals have not yet been obtained. This list includes the most common permits and approvals related to water and air quality, waste, and the environment. Other permits and approvals, including Township approvals may also be necessary.

1. Y N Will the project involve the discharge of any type of wastewater to a storm sewer, drain, lake, wetland, or other surface water? Contact: MDNRE/Water Bureau @ (517) 335-4176; MDNRE/Land & Water Management @ (517) 373-1170; Meridian Township Dept. of Community Planning and Development @ (517) 853-4560.
2. Y N Will the project involve any construction work, fill with any material, or soil disturbance in the 100-year floodplain? Contact: MDNRE Land & Water Management/Floodplain Management @ (517) 335-3181 and Meridian Township Dept. of Community Planning & Development @ (517) 853-4560.
3. Y N Will the project involve the direct or indirect discharge of waste, waste effluent, wastewater, pollutants, and/or cooling water into the groundwater or on the ground? Contact: MDNRE/ Waste & Hazardous Materials @ (517) 335-2690.
4. Y N Will the project involve construction or alteration of any sewage collection or treatment facility? Contact: MDNRE/Water Bureau @ (517) 335-4176. For discharging to surface waters; Contact: MDNRE/Water Bureau @ (517) 335-4176. For discharging to groundwater; Contact: MDNRE/Waste & Hazardous Materials @ (517) 335-2690.
5. Y N Will the project or facility store or use chemicals, petroleum products, or salt? Depending on the type of substance, secondary containment and a Pollution Incident Prevention Plan (PIPP) may be required. Contact: MDNRE/Waste & Hazardous Materials @ (517) 373-8481; Ingham County Health Dept./Environmental Health Division @ (517) 887-4312; Meridian Township Fire Administration @ (517) 853-4700..
6. Y N Will the project involve the installation, operation, or removal of an underground or above ground storage tank containing a petroleum product or hazardous substance? Contact: MDNRE/Waste & Hazardous Materials @ (517) 335-4035 and Meridian Township Fire Administration @ (517) 853-4700.
7. Y N Will the project involve liquefied petroleum gas storage tanks, container filling station, or a compressed natural gas dispensing station? Contact: MDNRE/Waste & Hazardous Materials @ (517) 335-4035.
8. Y N Will the project involve the generation of hazardous waste or medical waste? Hazardous Waste Contact: MDNRE/Waste & Hazardous Materials @ (517) 335-9875. Medical Waste Contact: MDNRE/Waste & Hazardous Materials @ (517) 241-1320 or (517) 335-1146.
9. Y N Will the project involve the on-site treatment, storage, or disposal of hazardous waste? Contact: MDNRE/Waste & Hazardous Materials @ (517) 335-9875.
10. Y N Will the project involve the transport of hazardous waste or non-hazardous liquid industrial waste? Contact: MDNRE/Waste & Hazardous Materials @ (517) 335-9875.
11. Y N Will the project involve landfilling, transferring or processing solid non-hazardous wastes on site? Contact: MDNRE/Waste & Hazardous Materials @ (517) 335-2690.
12. Y N Will the project involve the installation, construction, reconstruction, relocation, or alteration of any process or process equipment (including air pollution control equipment) which could emit air contaminants? Contact: MDNRE/Air Quality @ (517) 373-7023.

13. Y N Will the project or facility involve the storage, mixing, or distribution of pesticides or fertilizers in bulk quantities? Contact: **Michigan Department of Agriculture/Region 6 Pesticide & Plant Pest Management @ (517) 335-1830.**
14. Y N Will the project involve a manmade change in the natural cover (land clearing) and/or topography of land, such as cut/fill activities that may contribute to soil erosion/sedimentation? Contact: **Meridian Township Dept. of Public Works & Engineering @ (517) 853-4440 and MDNRE/Land & Water Management @ (517) 373-1170.**
15. Y N Will the project involve any dredging, filling with any material, or construction in, across, under, or within 500 feet of a river, stream, creek, ditch, drain, lake, pond, swamp, or wetland(s)? Contact: **MDNRE/Land & Water Management @ (517) 373-1170 and Meridian Township Dept. of Community Planning & Development (517) 853-4560.**
16. Y N Will an on-site wastewater treatment system or septic system be installed? For subsurface sanitary sewage disposal in quantities of 10,000 gallons per day or less: For any subsurface discharge or sanitary sewage in quantities equal to or greater than 10,000 gallons per day. Contact: **MDNRE/Waste & Hazardous Materials @ (517) 335-2690.**
- For subsurface disposal of sanitary sewage in quantities of 6,000 to 10,000 gallons per day: In addition to obtaining a construction permit from the Ingham County Health Department, submit a state wastewater discharge notification form. Flow monitoring and reporting are required. Contact: **MDNRE/Waste & Hazardous Materials @ (517) 335-2690.**
- For industrial or commercial wastewater (other than sanitary sewage) in any quantity. Contact: **MDNRE/Waste & Hazardous Materials @ (517) 335-2690.**
17. Y N Will the project involve construction of a water supply well or extension of a water supply service from an existing water system? Contact: **MDNRE/Water Bureau @ (517) 241-1374 and Ingham County Health Dept./Environmental Health @ (517) 887-4312.**
18. Y N Are there out-of-service wells, abandoned wells, or cisterns on the site? (drinking water, irrigation & monitoring wells). Contact: **MDNRE/Water Bureau @ (517) 241-1413; Ingham County Health Dept./Environmental Health @ (517) 887-4312; and Meridian Township Department of Community Planning & Development @ (517) 853-4560.**
19. Y N Will the project involve a subdivision or site condominium project utilizing individual on-site subsurface disposal systems or individual wells? Contact: **Ingham County Health Dept./Environmental Health @ (517) 887-4312.**
20. Y N Will the project involve the on-site storage of sanitary sewage prior to transport and disposal off-site (pump and haul)? Contact: **MDNRE/Waste & Hazardous Materials @ (517) 335-2690.**
21. Y N Has the site/facility ever been subject to a remedial action, limited closure, or other environmental cleanup response under Part 201, Natural Resources and Environmental Protection Act (NREPA)? Is the property currently subject to a response action? Has a Baseline Environmental Assessment (BEA) been completed for the property? Contact: **MDNRE/Remediation & Redevelopment @ (517) 373-9837 and/or MDNRE/Waste & Hazardous Materials @ (517) 335-2690.**
22. Y N Will the project involve the installation of a seawall or bulkhead? Contact: **MDNRE/Land & Water Management @ (517) 373-1170 and Meridian Township Dept. of Community Planning & Development @ (517) 853-4560.**

Notes:

- For assistance with permits and approvals from the Michigan Department of Natural Resources and Environment (MDNRE), including coordination among MDNRE divisions, contact the Permit Coordination Unit at (517) 373-9244.
- For assistance on environmental issues at the MDNRE, contact the Environmental Assistance Center at (800) 662-927
- For Spill/Release reporting to the MDNRE, call (517) 373-8481.
- For pollution emergencies, call the MDNRE at (800) 292-4706 in Michigan and (517) 373-7660 outside of Michigan.



Barry-Eaton District Health Department

An Accredited Public Health Agency

www.barryeatonhealth.org

Regulations Governing On-site Sewage and On-site Water Supply System Evaluation and Maintenance in Barry and Eaton County, Michigan

Adopted by the Barry-Eaton District Health Department

Board of Health on May 7, 2007

Effective October 16, 2007

Barry-Eaton District Health Department
Evaluation and Maintenance Regulation

Table of Contents	1,2
Article I – Title, Purpose, Authority and Jurisdiction	3
Section 1.1 Title	3
Section 1.2 Purpose	3
Section 1.3 Authority	3
Section 1.4 Jurisdiction	3
Article II – Definitions	3
Section 2.1 Definitions	3 - 7
Article III –General Provisions	7
Section 3.1 General Provisions	7
Section 3.2 Restrictions on Sale or Transfer of a Parcel Containing an On-site Sewage System or an On-site Water Supply	7
Section 3.3 Annual Evaluation of Alternative Sewage Systems and Community Systems	8
Article IV - Powers and Duties of the Health Officer	8
Section 4.1 General Provisions	8
Section 4.2 Power to Establish Policy, Criteria and Standards	8
Article V - Types of Evaluations	8
Section 5.1 Transfer Evaluation	8
Section 5.2 Alternative Sewage System and Community System Evaluations	9
Section 5.3 Exemptions	9
Article VI - Evaluation Reports	10
Section 6.1 Transfer Evaluation and Alternative Sewage System Evaluation. Summary of Findings (Documentation)	10
Article VII - Evaluation Frequency	11
Section 7.1 Transfer Evaluations	11
Section 7.2 Vacant Premises/ Winter Conditions	11
Section 7.3 Alternative Sewage System & Community System Evaluations	11
Section 7.4 Other Evaluations	11
Article VIII – Evaluator Requirements	12
Section 8.1 Registration and Certification	12
Section 8.2 Revocation of Registration	12
Article IX – Failures	13
Section 9.1 Notice	13
Section 9.2 Conformance with Permit	13

Barry-Eaton District Health Department
Evaluation and Maintenance Regulation

Section 9.3 Failure Remediation	13
Article X – Responsibilities of Persons	13
Section 10.1 Owner	13
Section 10.2 Registered Evaluator	14
Section 10.3 Municipality	15
Section 10.4 Health Department	15
Article XI – Appeals	16
Section 11.1 General Provisions	16
Section 11.2 Administrative Reviews	16
Article XII – Compliance and Enforcement	16
Section 12.1 Investigations	16
Section 12.2 Enforcement and Compliance	17
Section 12.3 Assessment Against the Property	17
Section 12.4 Right to Obtain Samples	17
Article XIII – Fees	17
Section 13.1 General Provisions	17
Article XIV – Severability	17
Section 14.1 General Provisions	17
Article XV – Amendments	17
Section 15.1 General Provisions	18
Article XVI – Other Agency Requirements	18
Section 16.1 Conflicts and Inconsistencies	18
Section 16.2 Local Ordinances	18
Section 16.3 Validity of Property Transfer	18
Article XVII – Penalties	18
Section 17.1 Violations	18
Section 17.2 Civil Penalties	18
Section 17.3 Injunctive Proceedings	18
Article XVIII – Conflict of Interest	18
Section 18.1 General Provisions	18
Section 18.2 Enforcement	19
Article XIX – Approval and Effective Date	19
Section 19.1 General Provisions	19

ARTICLE 1 – TITLE, PURPOSE, AUTHORITY AND JURISDICTION

SECTION 1.1 – Title

These Regulations shall be identified by the title “Regulations Governing On-site Sewage and On-site Water Supply System Evaluation and Maintenance in Barry and Eaton County, Michigan”.

SECTION 1.2 – Purpose

These Regulations are adopted to protect the quality of water resources, on-site water supplies and the natural environment and to protect the public health by providing an evaluation and maintenance program for on-site sewage systems and on-site water supply systems in Barry and Eaton County by: (1) regulating the sale or transfer of parcels containing on-site sewage systems or on-site water supply systems; (2) regulating on-site sewage system and on-site water supply system evaluations; (3) regulating alternative on-site sewage system evaluations and maintenance and (4) effecting compliance with the provisions of the Public Health Code. It is not the intent of this Regulation to cause existing functional systems, which do not meet current construction standards, and in the case of on-site water supply systems, which are not subject to contamination, to be brought into compliance with such standards.

SECTION 1.3 – Authority

These Regulations are adopted pursuant to authority conferred upon local Health Departments by Section 2441(1) of the Public Health Code.

SECTION 1.4 – Jurisdiction

The responsibility for administration and enforcement of these Regulations shall reside with the Health Officer of the Barry-Eaton District Health Department. These Regulations, including all amendments, shall be in full force and effect throughout all areas of Barry and Eaton County, incorporated and unincorporated.

ARTICLE II – DEFINITIONS

SECTION 2.1 – Definitions

Abandoned well – Any of the following: a) a well, which has its use permanently, discontinued, b.) a well which is in such disrepair that its continued use for the purpose of obtaining groundwater is impractical, c.) a well which has been left uncompleted, d.) a well which is a threat to groundwater resources, e.) a well which is or may be a health or safety hazard.

Absorption system- That part of a sewage system in which septic tank effluent is distributed to a subsurface trench, bed or other approved means that allows the effluent to be absorbed and treated by the surrounding soil; also called drainfield,

**Barry-Eaton District Health Department
Evaluation and Maintenance Regulation**

drainbed, disposal field, tile field, disposal bed or other system approved by the Health Department.

Alternative Sewage System Evaluation - The process of determining the condition and state of acceptability of the system and performing all necessary maintenance to said system. This process may include but is not limited to; observations, sample collection, information gathering, the exercising of judgments, the preparation of documentation including a summary of findings and submittal of those findings to the Health Department.

Appeal – A formal written request for administrative review of any decision, action, or failure to act, on the part of the Health Officer, pursuant to the provisions of these Regulations.

Approved/Approval – Approved or approval denotes that a condition, facility, thing, premise, action, use, or maintenance is in satisfactory compliance with the intent, purpose and applicable standards of these Regulations.

Available Public Sanitary Sewer – A public sewerage system located not more than 200 feet or a greater distance as approved by the sewer authority at its nearest point to a premises from which sanitary sewage originates, the use of which is permitted by the responsible governmental entity.

Certified Evaluator – a person who has satisfactorily completed training courses in both on-site sewage systems and on-site water supplies and/or has demonstrated knowledge and expertise of a subject area through registrations or certifications as approved by the Health Department.

Certified Alternative System Evaluator – a person who has satisfactorily completed advanced level training course's in alternative on-site sewage systems and has demonstrated knowledge and expertise of a subject area through registrations or certifications as approved by the Health Department.

Community System – a sewage system serving more than one dwelling not under the same ownership (other than municipality owned systems) and generating more than one thousand gallons per day and less than ten thousand gallons per day and in accordance with the Michigan Criteria for Subsurface Sewage Disposal.

Complete Evaluation - Documentation of an inspection that includes all of the required information as determined by the Health Department.

Dosing Chamber – A watertight tank or receptacle used for the purpose of retaining the overflow or effluent from a septic tank, pending its automatic discharge to a selected point, typically an absorption system.

Effluent – The partially treated sanitary sewage outflow discharge of a septic tank or similar detention device.

**Barry-Eaton District Health Department
Evaluation and Maintenance Regulation**

Failure of On-site Sewage System – A substantial non-conforming system; the backup of sanitary sewage into the premise or habitable building; direct discharge of sanitary sewage and/or effluent to a water course, surface drain, field tile or the ground surface; discharge of effluent from the sewage system to a storm sewer, field tile or surface drain; presence of liquid in the septic tank above the invert of the septic tank outlet; presence of liquid in the septic tank below the invert of the outlet (as associated with a leaking septic tank); failure or dilapidation of the physical septic tank structure or other system components; or discharge of sanitary sewage from the structure which does not reach the absorption system.

Failure of On-site Water Supply System – Unsafe water sample and/or water sample not meeting the drinking water standards as established by the Environmental Protection Agency, the presence of an abandoned well, substantial non-conformance with water well construction requirements or substantial non-conformance with water well isolation from contamination source requirements.

Habitable Building – Any structure or part thereof, or other place where human beings reside, are employed, or congregate, or any structure adopted for such purposes.

Health Department – The Barry-Eaton District Health Department.

Health Officer - The Administrative Officer who is in charge of the Barry-Eaton District Health Department or his/her authorized designee.

Municipality - Shall mean any incorporated city, village, or township within Barry and Eaton Counties.

On-site Sewage System – A device or method, including all requisite treatment tanks, piping, pumps, vents, and soil absorption areas, or privies used to treat and/or dispose of all sewage emanating from a home, business, or industrial establishment that is located entirely on the property occupied by said sewage systems including conventional and alternative systems.

On-site Subsurface Sewage System, Conventional – A system which includes a building sewer, one or more septic tanks, an absorption system, and all associated connections, fittings, and appurtenances.

On-site Subsurface Sewage System, Alternative – A system constructed in accordance with a plan prepared by a professional currently licensed under Act 299, P.A. 1980, Act 368, P.A. 1978, Part 184, or other qualified professional approved by the Health Department, which employs design features, processes, construction or operational methods other than those which apply to a conventional on-site subsurface sewage system or to a low pressure dose mound.

On-site Water Supply - A system of pipes and structures through which water is obtained, including but not limited to: the source of the water such as wells, or

**Barry-Eaton District Health Department
Evaluation and Maintenance Regulation**

hauled water storage tanks, pumping and treatment equipment, storage tanks, pipes and appurtenances used or intended to furnish water for potable use.

Owner – Any person, agency, firm or corporation having a legal or equitable interest in the property.

Parcel – A lot or a distinct portion or tract of land containing an on-site sewage system or on-site water supply system.

Person – Any individual, natural person, trustee, court appointed representative, agency, group, association, organization, firm, corporation, club, institution, partnership, or other legally definable entity.

Premises – Any house, building, structure, facility or improvement from which sanitary sewage originates or which is served by a on-site sewage system and/ or on-site water supply system.

Public Health Code – Public Act 368, 1978, as amended; MCL 333.1101 et.seq.

Public Sanitary Sewer – A system of pipes and conduits used or intended to be used for the collection and transportation of sanitary sewage, which is owned, operated and maintained by a governmental entity.

Public Water Supply - A water supply which provides water for drinking or household purposes to persons other than the supplier of water, as defined in MCL 325.1002.

Registered Evaluator - An individual who is certified, who satisfactorily complies with the registration requirements of these Regulations, and whose name is on the Health Department's registration list.

Registered Well Drilling Contractor - A person holding a valid certificate of registration as a well drilling contractor, as provided in Sections 12703 to 12715 of the Public Health Code.

Regulations – Regulations governing on-site sewage systems and on-site water supply system evaluation and maintenance in Barry and Eaton County, Michigan.

Sanitary Sewage – All domestic liquid waste from laundry, bathing, cooking, cleaning, sink waste, therapeutic bathing, human excreta, dishwasher and garbage disposals. Sanitary sewage shall not include waste or water from water softening and treatment devices, roof runoff, footing or storm drainage and waste or water from industrial and commercial processes.

Septage - Any human excrement or other domestic waste, including gray water and other material or substance removed from a portable toilet, septic tank, seepage pit, cesspool, sewage lift station or other enclosure, but does not include liquid industrial waste.

**Barry-Eaton District Health Department
Evaluation and Maintenance Regulation**

Septic Tank – A sound, watertight, covered receptacle designed and constructed to receive the discharge of sewage, separate solids from the liquid, digest organic matter and store digested solids through a period of detention and allow the clarified liquids to discharge to an absorption system.

Substantial Non-conformance, Sewage System – Condition(s) identified during a sewage system evaluation which meet one or more of the following; an unrecognizable sewage system, method or thing that varies so significantly from customary or recognized methods that its continued use cannot be acknowledged as meeting a minimum standard (does not meet the conventional or alternative definition).

Substantial Non-conformance, Water Supply System – An on-site water supply system that is not capable of meeting the intended use, a method or thing that varies so significantly from customary and recognized construction standards that its continued use cannot be acknowledged as meeting a minimum standard.

Transfer Evaluation - The process of determining, in relation to the sale or transfer of a parcel containing an on-site sewage and/or water supply system, the condition and state of acceptability of the system(s). This process includes observations, sample collection, information gathering, the exercising of judgments, and preparation of a summary of findings.

Transfer Authorization – a report or other documentation created by the Health Department describing the condition of the on-site sewage system and/or the on-site water supply and approving the sale or transfer in compliance with this regulation.

ARTICLE III – GENERAL PROVISIONS

SECTION 3.1 – General Provisions

When not inconsistent with the context, words used in the present tense include the future, words in singular number include the plural number, and words in the plural number include the singular number. The word “shall” is always mandatory, and not merely directory. Words and terms not defined herein shall be interpreted in the manner of their common usage.

SECTION 3.2 – Restrictions on Sale or Transfer of a Parcel Containing an On-Site Sewage System or an On-Site Water Supply

Subject to the provisions of Section 5.3, there shall be no sale or transfer of a parcel containing an on-site sewage system (conventional or alternative) and/or on-site water supply system until all of the following have occurred:

**Barry-Eaton District Health Department
Evaluation and Maintenance Regulation**

- A. The documentation of a transfer evaluation by a registered evaluator has been submitted to the Health Department.
- B. At the time of the transfer evaluation, the Health Department has determined that the condition or operation of the system is not in a state of failure or that any necessary system maintenance or remediation has been completed or assured and approved by the Health Department.
- C. The Health Department has issued a transfer authorization for sale or transfer of the parcel.

SECTION 3.3 – Annual Evaluation of Alternative Sewage Systems and Community Systems

Beginning January 1, 2008, all alternative sewage systems and community systems in Barry and Eaton County shall have annual evaluation of the operation of the system and system maintenance completed by a Registered Alternative System Evaluator and a report submitted to the health department. The findings of the operation and maintenance evaluation, including a summary of the maintenance performed, shall be submitted to the Health Department on approved forms within thirty (30) days of completion of the evaluation.

ARTICLE IV – POWERS AND DUTIES OF THE HEALTH OFFICER

SECTION 4.1 - General Provisions

The Health Officer is responsible for regulating the evaluation, operation and maintenance of all on-site sewage systems and on-site water supply systems within Barry and Eaton Counties. The Health Officer is also empowered to exercise control over on-site sewage systems and on-site water supply systems regulated by others when so authorized by the public agencies possessing statutory jurisdiction over such on-site sewage systems and on-site water supply systems.

SECTION 4.2 - Power to Establish Policy, Criteria and Standards

The Health Officer is empowered to establish criteria, policies and standards concerning the application and interpretation of these Regulations, and for the purpose of carrying out the responsibilities delegated to the Health Officer by law.

ARTICLE V – TYPES OF EVALUATIONS

SECTION 5.1 – Transfer Evaluations

A transfer evaluation shall consist of visual and olfactory observations of the on-site sewage system, use conditions, information gathering, pumping of septage at a frequency established by the Health Department, inspection of the condition of the septic tank, absorption system, pumps, filters and other important features of the sewage system; visual observation and water quality sampling of an on-site water supply system; visual observation of any abandoned well(s), and the preparation of a summary of the findings including use conditions. Water samples shall be collected

**Barry-Eaton District Health Department
Evaluation and Maintenance Regulation**

and analyzed at a laboratory certified by the Michigan Department of Environmental Quality to determine the presence of coliform bacteria, nitrate concentration, and other contaminants as determined by the Health Department. Transfer evaluation authorizations shall be valid for one year from the date of evaluation.

SECTION 5.2 – Alternative Sewage System & Community System Evaluations

An alternative sewage system and/or community system evaluation shall consist of visual and olfactory observations of the on-site sewage system, use conditions, information gathering, pumping of septage at a frequency established by the Health Department, inspection of the condition of the septic tank, absorption system, pumps, filters, alarms, control panels, pre-treatment devices and other important features of the sewage system. Alternative system evaluations may also require laboratory samples and analysis to identify and/or confirm if the system is functioning as intended. Alternative system evaluations shall include the completion of all necessary and routine maintenance of the system as determined by the Health Department. The person, firm or entity performing such maintenance shall be authorized or licensed, where required by state statute and/or product manufacturer to perform said maintenance.

SECTION 5.3 – Exemptions

A transfer evaluation is not required by Article III. Section 3.2:

- A. If as a condition of sale or transfer, and upon written demonstration to the Health Department, the structure is to be connected to an available public sanitary sewer and/or public water supply within six months of the sale or transfer.
- B. During the first three years after final approval by the Health Department of a permitted and newly constructed on-site sewage system and/or permitted and newly constructed on-site water supply system. The use of the system(s) shall be consistent with the intended use and conditions at time of permit and final approval. The system shall not be in a state of failure, altered after final approval from its original physically constructed form, or located on a parcel separate from the premise, which the system(s) serve. The owner shall provide written documentation to the Health Department stating the conditions for exemption.
- C. If a transfer evaluation occurred within twelve months of the date of sale or transfer, and the pertinent transfer evaluation summary of findings was filed with the Health Department and transfer authorization was issued by the Health Department
- D. When a mortgage or other payment obligation is refinanced.
- E. If the owner or authorized agent provides written documentation to the Health Department that the premises shall be demolished and shall not be occupied after the property transfer.
- F. Transfers from a husband or wife or husband and wife creating or disjoining a tenancy by the entireties in the grantor or the grantor and his or her spouse.
- G. Judgments or orders of courts of record making or ordering transfers, except where a specific monetary consideration is specified or ordered by the court.

**Barry-Eaton District Health Department
Evaluation and Maintenance Regulation**

- H. Transfers that create a joint tenancy between two or more persons where at least one of the persons already owned the property.
- I. Land contract transfers that were in effect prior to the implementation of this regulation.
- J. Alternative sewage system sites and community systems with an approved evaluation in accordance with Section 5.2 and Section 7.3.

ARTICLE VI - EVALUATION REPORTS

SECTION 6.1 – Transfer Evaluation and Alternative Sewage System Evaluation

Summary of Findings (Documentation)

Evaluation documentation shall be prepared on forms approved by the Health Department and submitted as follows:

The Registered Evaluator shall provide complete documentation of each transfer evaluation to the owner and the Health Department within 20 days of the evaluation. In addition, documentation of a transfer evaluation shall be provided to the Health Department no less than five business days prior to scheduled closing of the sale or transfer. Documentation of an evaluation shall include, at a minimum, information prescribed by the Health Department including observations, findings and recommendations to prevent premature failures. With the evaluation documentation, the Registered Evaluator shall provide the owner or owner's agent with educational materials about system maintenance that have been approved by the Health Department.

Evaluation documentation shall include, but is not limited to:

- A. The address of the site.
- B. The parcel identification number.
- C. The name of the owner.
- D. The location of the system(s).
- E. A description of the current operational or functional status of the system(s).
- F. Identification of any necessary repairs or replacement of all or portions of the system(s).
- G. Identification and location of any abandoned wells or multiple on-site wells on the parcel. (This item is not required for alternative system evaluations per Sec. 5.2.)
- H. The results of all coliform bacteria and nitrate drinking water analysis, and/or other water quality parameters as required by the Health Department. (This item is not required for alternative system evaluations per Sec. 5.2.)
- I. Other relevant or unusual observations related to the system(s).
- J. Educational materials about system maintenance that have been approved by the Health Department.
- K. A detailed site plan illustrating features of the parcel and in accordance with the requirements of the Health Department.

**Barry-Eaton District Health Department
Evaluation and Maintenance Regulation**

- L. Evaluation documentation shall be completed on forms approved by Health Department.

ARTICLE VII – EVALUATION FREQUENCY

SECTION 7.1 – Transfer Evaluations

All on-site sewage systems and/or on-site water supply systems shall have a transfer evaluation prior to the sale or transfer of the parcel, except as provided in Sections 5.3 and/or 7.2 (B)

SECTION 7.2 – Vacant Premises/Winter Conditions

- A. If the parcel or structure served by a system(s) is vacant for more than 10 days prior to the transfer evaluation, the transfer evaluation shall be performed. If approved, the transfer authorization shall include statements indicating the limitations of an evaluation when a habitable dwelling and/or premise is not occupied and the system(s) is not under normal use.
- B. If winter weather conditions preclude completing the transfer evaluation specified in Section 5.1, the transfer evaluation may be delayed at the owner's written request and with the concurrence of the Health Department.

SECTION 7.3 – Alternative Sewage System & Community System Evaluations

All alternative sewage systems and community systems shall have an annual evaluation and maintenance performed by a certified alternative system evaluator registered with the Health Department. The evaluation shall take place during the calendar year and shall not have been preceded with an evaluation within the previous six months.

SECTION 7.4 - Other Evaluations

The Health Department may determine a different frequency of system evaluations:

- A. For non-residential structures;
- B. For unique, unusual or alternative sewage systems; or
- C. When the system is determined by the Health Department to be inadequate for the current use or size of the premise which it serves.

ARTICLE VIII – EVALUATOR REQUIREMENTS

SECTION 8.1 Registration and Certification

All evaluators performing evaluations under this Regulation must be registered with the Health Department and certified before undertaking any evaluations. All qualified applicants must file an application with the Health Department, pay the Health Department registration fee annually and satisfactorily complete training course(s) approved by the Health Department. Registrations shall expire December 31 of each year. Prospective evaluators must demonstrate knowledge of construction practices, operational standards as well as the causes and indicators of on-site sewage systems and/or on-site water supply failures. Registered evaluators shall maintain general liability insurance and provide proof of general liability insurance to the Health Department. No transfer evaluation summary of findings/documentation shall be accepted from individuals not registered by the Health Department.

SECTION 8.2 Revocation of Registration

The Health Officer may revoke any certified evaluator's registration under one or more of the following circumstances:

- A. The individual fails to comply with the Regulation;
- B. The Health Officer determines that the individual is incompetent;
- C. The individual is unable to properly perform an evaluation of an on-site sewage system and/or on-site water supply system;
- D. The individual is negligent in the discharge of his/her duties.
- E. The individual submits false or misleading information;
- F. Significant information is missing from the transfer evaluation documentation and/or is not provided within three (3) business days after being requested by the Health Department; or,
- G. The individual does not maintain the required certification as required by this Regulation.
- H. The individual is found to have a conflict of interest as identified in Article XVIII.

The Health Department shall give written notice to a Registered Evaluator before revocation by the Health Officer. The Registered Evaluator shall be given an opportunity at an informal meeting with the Health Department and/or the Health Officer to demonstrate why his/her registration should not be revoked. Any Registered Evaluator whose registration is revoked may appeal that decision by following the procedure in Article XI of this Regulation.

If a Registered Evaluator's registration is revoked, re-registration shall be contingent upon completing the requirements established by the Health Department.

ARTICLE IX – FAILURES

SECTION 9.1 – Notice

When the Health Department determines or concurs with a registered evaluator that a system is failing, a notice shall be sent by the Health Department, to inform the owner regarding remedial actions needed to bring the system into compliance.

SECTION 9.2 - Conformance with Permit

If a failing system cannot be connected to an available public sewer or available public water, any remediation of the failing or potentially failing system must be in conformance with a system permit issued by the Health Department. Proper closure of abandoned wells by a registered well driller does not require permitting by the Health Department.

SECTION 9.3 – Failure Remediation

Upon receiving written notice from the Health Department of remedial actions needed to bring the system into compliance with applicable Regulations, the owner, or authorized agent shall, within 30 days, submit a proposed corrective action plan and a good faith estimate or contract for services in order to bring the affected system into compliance with applicable laws. In addition, the owner, or authorized agent shall place into an escrow account, a deposit of a surety or performance bond or cash in an amount equal to one and one-half times the estimated cost of performance of such plan. The Health Department shall review the proposed corrective action plan and amend it as required to conform to federal, state and local laws, rules and regulations. All necessary corrective action shall be completed within 180 days following Health Department approval of the proposed corrective action plan. Once the Health Department gives final approval of the completed corrective action, the system shall be deemed to be in substantial conformance with these Regulations and any affidavit previously filed with the Registrar of Deeds shall be discharged at no cost to the owner. If a system presents an immediate health hazard, the owner or other responsible party shall take such measures, in cooperation with the Health Department, that will immediately reduce or eliminate the impact of such failure until the full remediation plan can be implemented as described in this section.

ARTICLE X – RESPONSIBILITIES OF PERSONS

SECTION 10.1 – Owner

The responsibilities of the owner of a parcel containing a system include:

- A. Maintaining the system to prevent failure and resulting public health hazards or environmental pollution.
- B. Notifying the Health Department of any known or suspected system failure.
- C. Proper closure, by a registered well driller, of all abandoned wells.

**Barry-Eaton District Health Department
Evaluation and Maintenance Regulation**

- D. Acquiring a transfer evaluation prior to sale or transfer of the parcel.
- E. Acquiring annual alternative sewage system evaluation (for those parcels served by an alternative sewage system).
- F. Cooperating with the registered evaluator or Health Department representative by allowing access to the parcel, structures and the system, providing pumping of the septic tank when necessary, providing pertinent information to the evaluator and the Health Department and paying any required fee or charge.
- G. Remediating any system failure:
 - 1. For transfer evaluations, the owner must present documentation to a prospective buyer, prior to closure, that the corrective action plan required in Section 9.3 has been approved by the Health Department concerning who is responsible and how and when the remediation will be completed.
 - 2. If a public sanitary sewer is available, the owner shall apply to the municipality for a permit to connect the structure to the available public sanitary sewer or public water supply system.
 - 3. If no public sanitary sewer is available, the owner shall apply for a permit from the Health Department for any remediation, which involves repair, expansion or replacement of the system.
- H. If a system evaluation is exempted under Section 5.3, notify in writing to the Health Department of the sale or transfer and the reason that a system evaluation is not required.
- I. Notifying the Health Department of the purchase or acquisition of a parcel or structure served by a system not more than 45 days after the date of occupancy of the parcel or structure if the system had not been evaluated prior to the closing of the sale or transfer because winter conditions prevented the transfer evaluation specified in Section 5.2 prior to purchase or acquisition.
- J. Obtain a review, by the Health Department, of the on-site sewage and/or on-site water supply system prior to any property alterations as specified in section 10.3.

SECTION 10.2 - Registered Evaluator

The responsibilities of the Registered Evaluator include:

- A. Providing documentation of each evaluation in accordance with Section 5.1, Section 5.2, Section 6.1 and other applicable provisions of this regulation.
- B. Follow Health Department established policy, criteria and standards for evaluation of On-site sewage and water supply systems.
- C. Providing owners with information on system maintenance. Such information may be in the form of brochures or fact sheets approved by the Health Department.
- D. Participating, upon notice from the Health Department, in administrative conferences, administrative hearings or other compliance or enforcement actions.

SECTION 10.3 – Municipality

Responsibilities of the municipality, or agent authorized by the municipality, include:

- A. Assuring that the review of the Health Department has been obtained by the owner of an existing premise served by an on-site sewage system and/or on-site water supply prior to:
 - 1. Issuance of a permit for building additions to an existing premises.
 - 2. Issuance of a permit for the construction of a detached structure, including but not limited to pole barns and swimming pools.
 - 3. Issuance of permits for the replacement of an existing habitable building and/or premise with a new structure and where the owner proposes to use the existing on-site sewage system and/or existing on-site water supply.
 - 4. Issuance of approvals or permits to allow an additional premise (in addition to the one which the system(s) currently serves) to be connected to an on-site sewage system and/or on-site water supply.
 - 5. Issuance of a demolition permit and/or upon notification from the owner that demolition of a premise or habitable structure is planned.
 - 6. Authorization of use changes that would increase the quantity of wastewater generated and/or change the characteristics of the wastewater generated to the existing on-site sewage system.
 - 7. Authorization of use changes that would increase the number of persons served by a public water supply system.
- B. Notifying the Health Department when premises formerly connected to an on-site sewage system are connected to the available public sanitary sewer.
- C. Notifying the Health Department when premises formerly connected to an on-site water system are connected to available public water supply.

SECTION 10.4 – Health Department

Responsibilities of the Health Department include:

- A. Administer and enforce this Regulation;
- B. Maintain the most current evaluation report as long as the property is served by an on-site sewage system and/or on-site water supply system and for three years thereafter;
- C. Maintain a list of Registered Evaluators to perform evaluations under this regulation.
- D. Require remediation where there is evidence of a system failure;
- E. Create and maintain a database of the systems inspected, evaluated and remedied.
- F. Establish criteria for the evaluation of on-site sewage systems and on-site water supply systems and the certification and registration of evaluators and make such criteria and related forms available to the public;
- G. Require risers, observation ports and other features to facilitate evaluations when issuing permits for the installation of on-site sewage systems.

**Barry-Eaton District Health Department
Evaluation and Maintenance Regulation**

- H. Issue transfer authorizations for sale, transfer or conveyance of property served by approved on-site sewage systems and/or on-site water supply systems.
- I. Review of proposed property alterations, new use of a property, or other changes on a parcel that may impact an existing on-site sewage system and/or on-site water supply or prevent adequate operation or replacement.
- J. Provide educational materials to the evaluators and the public.

ARTICLE XI – APPEALS

SECTION 11.1 – General Provisions

Any person taking exception to, or aggrieved by, a decision, ruling, requirement, violation notice, denial, disapproval or order issued by the Health Officer under these Regulations, after an opportunity for an Administrative Conference with the Health Officer or his/her designated representative, has the right to an administrative review. Such reviews shall be conducted in accordance with written procedures found in Article VIII of the Barry-Eaton District Health Department Sanitary Code and applicable provisions of the Administrative Procedures Act of 1969.

SECTION 11.2 – Administrative Reviews

Administrative Reviews shall be convened and conducted in accord with the Barry-Eaton District Health Department Sanitary Code.

ARTICLE XII – COMPLIANCE AND ENFORCEMENT

SECTION 12.1 – Investigations

If the Health Department believes that a person is violating these Regulations, or a rule promulgated under these Regulations, the Health Department shall make a prompt investigation. The Health Department may, after presenting proper credentials and other documents as may be required by law, and upon stating the authority and purpose for the investigation, enter and inspect any property at reasonable times to ascertain compliance or noncompliance with this Regulation or Rules promulgated under this Regulation. This may include:

- A. Inspection at reasonable times of any parcel containing an on-site sewage system and/or water supply and related systems.
- B. Collection of evidence and information for the purpose of determining compliance with this Regulation or Rules promulgated under the Regulation.

If after this investigation the Health Department finds that a violation exists, the Health Department shall attempt to enter into a voluntary agreement with the person.

If a voluntary agreement is not entered into, the Health Department may issue a violation notice or a citation to the owner or violator.

SECTION 12.2 – Enforcement and Compliance

Following the procedures of Section 12.1, which may include a hearing, the Health Officer may record an affidavit that details the non-compliance with the Barry County or Eaton County Register of Deeds. Upon compliance with these Regulations, either through a voluntary agreement, resolution through the appeal process or contested case hearing, or other resolution satisfactory to the Health Department, the Health Officer shall record a release of affidavit with either the Barry County or Eaton County Register of deeds

SECTION 12.3 – Assessment Against the Property

If an owner does not have his/her property evaluated as specified by these Regulations, the Health Department shall cause an evaluation to be performed and may charge all costs and fees for the evaluation to the owner of the premises and as a lien on the property.

SECTION 12.4 – Right to Obtain Samples

An evaluation under Section 5.1 and Section 5.2 shall include the right to obtain samples where the Health Officer has reason to believe that there is a likelihood of contamination of surface water, ground water, water supply or other unsanitary conditions. Upon written notice, an owner or occupant of premises from which such evaluation is sought shall cooperate with the Health Officer.

ARTICLE XIII – FEES

SECTION 13.1 – General Provisions

Fees for registrations or other Health Department services required or authorized by these Regulations shall be assessed according to the current fee schedule established by the Barry-Eaton District Health Department Board of Health.

ARTICLE XIV – SEVERABILITY

SECTION 14. 1- General Provisions

These Regulations and the various articles, sections and clauses are declared to be severable. If any article, sentence, paragraph, section, or clause is adjudged unconstitutional or invalid, the remainder of these Regulations shall not be affected.

ARTICLE XV – AMENDMENTS

SECTION 15.1 – General Provisions

The Health Officer may adopt amendments and revisions to these Regulations with the consent and approval of the Barry-Eaton District Health Department Board of Health, pursuant to Sections 2441 and 2442 of the Public Health Code.

ARTICLE XVI – OTHER AGENCY REQUIREMENTS

SECTION 16.1 – Conflicts and Inconsistencies

Where conflicts or inconsistencies exist between the provisions of these Regulations and any regulations, requirements, rules, standards, criteria or guidelines of the federal government or the State of Michigan, the more restrictive requirements shall govern and prevail.

SECTION 16.2 – Local Ordinances

These Regulations shall supersede inconsistent or conflicting local ordinances, pursuant to Section 2441 of the Public Health Code.

SECTION 16.3 – Validity Of Property Transfer

A property transfer subject to these regulations shall not be invalidated solely because of the failure of any person to comply with a provision of these regulations.

ARTICLE XVII – PENALTIES

SECTION 17.1 – Violations

Any person who violates the provisions of these Regulations shall be deemed guilty of a misdemeanor punishable by imprisonment for not more than 90 days, or a fine of not more than \$200.00 or both pursuant to Section 2441(2) of the Public Health Code. Each day that a violation of these Regulations continues shall be deemed a separate offense.

SECTION 17.2 – Civil Penalties

The Barry-Eaton Board of Health may adopt a schedule for monetary civil penalties to be assessed for violations of these Regulations as provided in Sections 2461 and 2462 of the Public Health Code.

SECTION 17.3 – Injunctive Proceedings

When any person has been found to have violated a provision of these Regulations, the Health Officer may maintain injunctive action to restrain, enjoin, prevent or correct a violation of these Regulations, or a condition which adversely affects the public health, as provided in Section 2465 of the Public Health Code.

ARTICLE XVIII – CONFLICT OF INTEREST

SECTION 18.1 – General Provisions

At no time shall a registered evaluator provide major repairs to an on-site wastewater system and/or on-site water system, which require registration, licensure

**Barry-Eaton District Health Department
Evaluation and Maintenance Regulation**

or permit to perform such work under this regulation, the Sanitary Code or other state statute, without first obtaining a permit, registration and/or licensure to perform such activities.

At no time shall a registered evaluator take unnecessary actions or make judgements leading to unnecessary repairs to an on-site wastewater system or on-site water system.

Section 18.2 Enforcement

Violation of the general provisions of the article shall be grounds for revocation of registration as in Article VIII.

ARTICLE XIX – APPROVAL AND EFFECTIVE DATE

SECTION 19.1 – General Provisions

These Regulations have been adopted by the Barry-Eaton District Board of Health on May 7, 2007 and approved by the Barry County Board of Commissioners on June 26, 2007 and the Eaton County Board of Commissioners on July 18, 2007. These regulations shall be effective 90 days after approval by both boards of commissioners. Contracts or purchase agreements executed on or after October 16, 2007 shall be subject to these Regulations.

Barry-Eaton District Health Department Board of Health

Leo Farhat (Eaton), Chairman
Michael Callton (Barry)
Jim French (Barry)
Jeanne Pearl-Wright (Eaton)
Carol Strachan (Eaton)
Jeff VanNortwick (Barry)

**INGHAM COUNTY HEALTH DEPARTMENT REGULATION AMENDING
THE SANITARY CODE BY ADDING CHAPTER VII
REGULATIONS FOR THE INSPECTION OF ONSITE WATER AND
SEWAGE DISPOSAL SYSTEMS AT THE TIME OF PROPERTY TRANSFER**

PREAMBLE: The maintenance of residential wells and septic systems is essential to the protection of public health and protection of the surface and ground water.

WHEREAS: The Ingham County Health Department will initiate action to resolve known surface water contamination problems; and the maintenance, and repair or modification of existing residential on-site septic systems and/or on-site water supply systems to prevent surface water pollution and potential ground water contamination; and,

WHEREAS: The Health Officer recommends the adoption of this regulation requiring the inspection and when necessary the repair and/or upgrading of onsite residential water supply and sewage treatment systems; and,

WHEREAS: Several meetings were held with Realtors, well drillers, inspectors, general public, municipalities, and septage haulers during the development of the regulation; and,

WHEREAS: Notice of a public hearing was given in accordance with Section 2442 of the Public Health Code, [MCL 333.2442] not less than 10 days before the public hearing and not less than 20 days before adoption of this Regulation.

THEREFORE BE IT RESOLVED, that the Board of Commissioners of the County of Ingham, Michigan, having considered the comments made at this public hearing on April 25, 2006, approves the following regulation, as an amendment to the Ingham County Sanitary Code, being Chapter VII. Regulation # 06109.

SECTION 701

Purpose

Sec. 701.1 The Ingham County Board of Commissioners approves this Regulation that states procedures, standards and enforcement that shall govern any residential premises containing an Onsite Water and/or Sewage Treatment System, (“OWSTS”) in order to promote the safety, health and general welfare of the community as follows:

- a) Ensure a safe, adequate supply of drinking water for those homes served by an Onsite Water Supply System (“OWSS”); and/or
- b) Ensure the adequate treatment of sewage from homes served by an Onsite Sewage Treatment System (“OSTS”); and

c) This Regulation shall not require existing systems that are currently in substantial conformance but do not meet existing construction standards, to be brought into compliance with such standards.

Rules Adopted

Sec. 701.2 This Regulation contains minimum standards and supplements the Rules and Regulations enacted by the Michigan Department of Environmental Quality and Ingham County. In addition, this Regulation supplements Michigan law as it relates to public health and environmental quality, and shall supersede all local minimum standards previously enacted that are inconsistent with this Regulation.

Authority

Sec. 701.3 This Regulation is enacted pursuant to MCL 333.2441 to protect the public health, safety and welfare of the citizens of Ingham County.

Jurisdiction

Sec. 701.4 The Health Officer shall have jurisdiction to administer and enforce the provisions of this Regulation. Nothing in this Regulation, however, shall be construed to restrict or abrogate the authority of the state, any municipality, or incorporated city, village or township in Ingham County to adopt standards that are more restrictive. However, whenever an inspection relating to health or sanitation is required, no municipality shall issue a permit without first having obtained written approval from the Health Officer indicating that the applicant has complied with the minimum requirements of this Regulation.

Effective Date

Sec. 701.5 This Regulation shall become effective in Ingham County 45 days after approval and notice of its adoption by the Ingham County Board of Commissioners is published in a newspaper of general circulation within Ingham County, provided, however, that actual inspections shall not begin before **June 9, 2006**, to insure that a sufficient number of inspectors are certified and available.

SECTION 702

Definitions

Sec. 702.1 The following rules of language shall apply to the text of this Regulation: The word “shall” is mandatory. The word “may” is permissive. When not inconsistent with the context, words in the present tense shall include the future, and words designating singular numbers shall include the plural.

Words and Terms

Sec. 702.2 The following words and terms used in this Regulation, unless otherwise expressly stated, shall have the following meaning:

Authorized Agent: The term “Authorized Agent” shall mean any individual or entity authorized, in writing, to act as the legal representative in all matters authorized by the seller or purchaser.

Certified Inspector: An individual authorized by the Department to provide evaluation(s) for compliance with this Regulation.

Department: Refers to the Ingham County Health Department.

Failure: The term “failure” is defined as follows: 1) the backup of sewage into a structure; 2) discharge of effluent onto the ground surface; 3) the connection of an OSTS to a storm drain; 4) liquid level in the septic tank above the outlet invert; 5) structural failure of a septic tank; 6) the discharge of sewage into any stream or other body of water; 7) unsafe potable water sample; and 8) substantial nonconformance with water well construction requirements and well isolation from pollution source requirements.

Health Officer: The term “Health Officer” shall mean the Health Officer, the acting Health Officer or his/her duly authorized representative.

Municipality: The term “municipality” shall mean any city, village, or township within Ingham County.

OSTS: The term “OSTS” shall mean an onsite sewage treatment system.

Owner: The term “Owner” shall mean any person who has legal title to any premises.

OWSS: The term “OWSS” shall mean an onsite water supply system.

OWSTS: The term “OWSTS” shall mean an onsite water and/or sewage treatment system.

Person: The term “person” shall mean any individual, firm, partnership, party, corporation, company, society, association, or other legal entity.

Premises: “Premises” shall mean any tract of land, or portion thereof, or combination of tracts of land under single or common ownership, operation or control, that contains a structure that is, was or will be inhabited either permanently or transiently, or an OWSTS.

Septage Hauler: The term “septage hauler” shall mean a firm licensed by the State of Michigan for the purpose of removing septic tank waste and properly disposing this waste.

Substantial Conformance: The term “Substantial Conformance” shall mean that the OWSTS meets with the current or past construction codes or regulations and presents minimal threat to degradation of groundwater and surface water or risk to the public health.

Substantial Nonconformance: The construction and location of an OWSTS which does not meet with current or past construction codes or regulations and represents a significant risk to the degradation of the groundwater and surface water, and/or poses a risk to the public health.

SECTION 703

Limitations on Sale or Transfer of Property

Sec. 703.1 There shall be no sale, transfer, or conveyance of a parcel containing an OWSTS until the following conditions are met:

- a) The seller must file an application with the Department for an evaluation of the OWSTS,
- b) The Department determines, based upon such evaluation, that the OWSTS is in substantial conformance and acceptable, or any necessary remediation is completed, or assured and accepted; and
- c) The Department issues a letter of compliance for this sale.

Evaluation

Sec. 703.2 Each OWSTS in Ingham County shall be inspected and evaluated prior to the sale. Transfers exempt from inspections include:

- a) Transfer from a spouse.
- b) Change in ownership solely to exclude a spouse.
- c) Transfer subject to life lease or life estate, (until the life lease or life estate expires).
- d) Transfer to effect foreclosures or forfeiture of real property.
- e) Transfer into a trust where the settlor or the settlor's spouse conveys property to the trust and is also the sole beneficiary of the trust.
- f) Transfer creating or ending joint ownership if at least one person is an original owner of the property or his or her spouse.
- g) Transfer to establish or release a security interest, i.e. pay off mortgage.
- h) Premises built within the previous twenty-four months prior to date of property transfer, i.e. newly constructed home with system approved by the Department.
- i) Premises that shall be demolished and shall not be occupied after the property transfer.
- j) New homes that have not been occupied.
- k) Municipal Sanitary Sewer and/or municipal water service will be available within three (3) months, and system is not failing. Affidavit will be required.
- l) Refinance of mortgage connected to the property.
- m) A property which receives a final inspection approval by the Department for either an on site water supply system or septic system during the previous twelve (12) months.

After the 12 month period has passed and the Department has not received a notice of deed transfer, the Department will notify the owner and/or applicant that the letter of approval has expired. At that time, the owner and/or applicant will have sixty (60) days to request a follow up inspection and if the inspection demonstrates conditions have not changed, an extension of the initial letter of approval for the property will be issued by the Department. This extension will not exceed twelve (12) months from the expiration date of the initial approval letter.

The owner of premises containing an OWSTS shall have the system evaluated by a Department certified inspector or Department staff. Persons certified to perform evaluations of an OWSTS shall meet the minimum standards in Sec. 703.6 of this Article. After the evaluation is complete, the Department shall issue a letter to the owner or the owner's designated representative (Section 703.1 c) and any prospective purchaser describing the functional status of the OWSTS and whether it is in conformance with the Ingham County rules and regulations governing the supply of groundwater and the treatment of sewage. A Michigan licensed septage hauler shall provide proof of service and an evaluation report to the owner and the Department.

Sec. 703.3 Reports of evaluations shall include, but are not limited to:

- a) The address of the site;
- b) The parcel identification number;
- c) The name of the owner or owner's agent;
- d) The location of the system(s);
- e) A description of the current operational or functional status of the system(s);
- f) Identification of any necessary repairs or replacement of all portions of the system(s);
- g) The results of potable water tests as required by the Department;
- h) Other relevant or unusual observations related to the system(s);
- i) Completed forms approved by the Department.

Sec. 703.4 A copy of the inspector's evaluation report of an OWSS shall be provided to the owner and a copy filed with the Department. Such reports shall be available to the public through the Freedom of Information Act, MCL 15.231 et seq.

Performance Standards

Sec. 703.5.1 The evaluation shall determine whether the system(s) have failed, are failing or in substantial nonconformance and affects the public health and environment, or violates any other applicable rules or regulation.

Sec. 703.5.2 The evaluation shall determine whether the OSTS structure and its operational status are in substantial conformance at the time of installation and with the Ingham County rules and regulations governing the treatment of sewage.

Sec. 703.5.3 OWSS shall be evaluated for:

- a) Their proximity to sources of pollution;
- b) Substantial conformance with State of Michigan construction standards at the time of installation; and,
- c) Compliance with National Primary Drinking Water Standards, with a minimum requirement for bacteria, nitrate, and arsenic tests or other water samples deemed necessary by the Department.

Sec. 703.5.4 Water samples shall be collected and analyzed at a laboratory certified by the Michigan Department of Environmental Quality.

Sec. 703.5.5 Certified Inspectors will not be allowed to perform system repairs for either well or septic systems which they have inspected.

Registration and Certification

Sec. 703.6 All inspectors performing evaluations under this Regulation must be registered with the Department and certified before undertaking any evaluations. All qualified inspector applicants must file an application with the Department, pay the County registration fee annually, and satisfactorily complete a training course approved by the Department. Prospective inspectors must demonstrate knowledge of construction practices and operational standards, as well as the causes and indicators of OWSS and/or OSTS (OWSTS) failures. Inspectors shall provide proof of commercial general liability insurance. No evaluation reports shall be accepted from individuals not certified by the Department.

Sec. 703.7 The Department or designated representative may de-certify any inspector under one or more of the following circumstances:

- a) The individual fails to comply with the Regulation;
- b) The individual is unable to properly perform an evaluation of an OWSTS;
- c) The individual is negligent in the discharge of his/her duties as outlined in the certification requirements;
- d) The individual submits false or misleading information;
- e) Significant information is missing from the evaluation report and/or is not provided within three (3) business days after being requested by the Department; or, but not limited to the above examples;

f) The Department determines that the individual has otherwise demonstrated professional incompetence.

g) The inspector does not maintain the required certification as required by this Regulation.

Sec. 703.8 The Department shall give written notice to an inspector before he/she is de-certified. The inspector shall be given an opportunity at an informal meeting with the Department and/or the Health Officer to demonstrate why he/she should not be de-certified. Any inspector who is de-certified may appeal that decision by following the procedure in Section 711 of this Regulation.

Sec. 703.9 If an inspector is de-certified, re-certification shall be contingent upon completing the requirements established by the Department.

SECTION 704

Responsibilities of Various Parties

Owner

Sec. 704.1 Owners are responsible for hiring certified inspectors to perform inspections and licensed septic haulers to service septic tanks under this Regulation prior to the sale of any premises that he/she owns. The owner must also secure a letter from the Department indicating the OWSTS complies with this Regulation before the sale or transfer of any premises that he/she owns. Owners are responsible for maintaining the OWSTS on their property and shall notify the Department if an evaluation report and/or septage hauler report indicates a failure and/or substantial nonconformance of the system.

Ingham County Health Department

Sec. 704.2 The Responsibilities of the Department are as follows:

- a) Administer and enforce this Regulation;
- b) Maintain the most current OWSTS evaluation report as long as the property is served by an OWSTS and for three years thereafter;
- c) Maintain a list of certified inspectors and licensed septage haulers;
- d) Require remediation where there is evidence of a failure or substantial nonconformance of a system;
- e) Create and maintain a database of systems inspected, evaluated and remediate;
- f) Establish criteria for the inspection of OWSTS and the certification of inspectors, and make such criteria and related forms available to the public;
- g) Issue a letter of compliance for the sale, transfer or conveyance of property;

h) Provide certified inspectors existing essential information pertaining to the property to be evaluated;

i) Provide educational material(s) about system(s) maintenance that have been approved by the Department; and,

i) Make recommendations to extend the life of the system(s) and to prevent the premature failure of the sewage system(s);

k) Prepare an annual report to present to the Board of Commissioners including number of inspections completed, number of failing systems found, number of systems in conformance or substantial nonconformance and number of repairs completed.

SECTION 705

Fees

Sec. 705.1 Fees to cover expenses, including but not limited to overhead, labor, storage, training etc., by the Department, shall be adopted as provided in the Public Health Code (Act 368 of 1978 as amended). Fees shall be paid when inspection reports are filed with the Department. Fees must be paid before the property is transferred.

SECTION 706

Failure/Substantial Nonconformance

Sec. 706.1 When as OWSTS is in substantial nonconformance or failure, the owner, agent or other responsible party shall contact the Department and shall complete all repairs ordered by the Department.

SECTION 707

Inspection Notification

Sec. 707.1 If, after reviewing the inspection, the Department determines that the OWSTS is not in substantial conformance as defined, the property owner shall be subject to enforcement as provided in this Regulation. The Department shall review, make a determination and issue a written notice within 5 business days from the date the complete report is filed with the Department by the inspector. Any party is considered notified if the notice is sent to that party's last known mailing address or to the property address if the party occupies the premises with the non-conforming OWSTS.

SECTION 708

Corrective Action

Sec. 708.1 Upon receiving written notice from the Department of failure or substantial nonconformance of a system, the owner, buyer or authorized agent shall, within thirty (30) days, submit a proposed corrective action and contract for services in order to bring the affected system into substantial conformance with applicable laws. If needed, the owner, buyer or

authorized agent shall place into an escrow account a deposit of a surety or performance bond or cash in an amount equal to one and one-half times the estimated cost of the contract guaranteeing performance of such contract. The Department shall review the proposed corrective action and amend it as required to conform to federal, state and local laws, rules and regulations. All necessary corrective action shall be completed within one hundred eighty (180) days following Department approval of the proposed corrective action plan. Once the Department gives final approval of the completed corrective action, the system shall be deemed to be in substantial conformance with this Regulation and any affidavit previously filed with the Register of Deeds shall be discharged.

If an OWSTS presents an immediate health hazard, the owner or other responsible party shall take such measures, in cooperation with the Department that will immediately reduce or eliminate the impact of a system failure until the full remediation plan can be implemented as described earlier in this Paragraph.

Sec. 708.2 A person who disputes any Department decision concerning the violation of this Regulation shall have the right to a hearing and appeal using the appeals process in Section 711. Any appeal shall not stay an owner's, buyer's or authorized agent's obligation to take measures to reduce or eliminate the impact of a system failure/substantial nonconformance until a full remediation plan can be determined and implemented.

SECTION 709

Enforcement and Compliance

Sec. 709.1 If, after investigation, the Department believes that a person is in violation of this Regulation, the Department shall attempt to enter a voluntary agreement with the property owner to resolve the violation. If a voluntary agreement cannot be reached, the Department may issue a violation notice to the owner. A statement of fact upon which the notice is based shall accompany the violation notice.

Sec. 709.2 The Department may, after presenting proper credentials and other documents as may be required by law, and upon stating the authority and purpose for the investigation, enter and inspect any property at reasonable times to ascertain compliance or noncompliance with this Regulation or Rules promulgated under this Regulation. This may include:

- a) Inspection at reasonable times of any parcel containing an OWSTS and related systems; and,
- b) Collection of evidence and information for the purpose of determining compliance with this Regulation or Rules promulgated under the Regulation.

Sec. 709.3 If an owner, transferee or purchaser does not comply with the requirements of this Regulation, a Health Officer or his/her duly authorized representative may record an affidavit that details the non-compliance with the Ingham County Register of Deeds.

SECTION 710

Specific Enforcement Options

Violation of the Regulation

Sec. 710.1 After learning that this Regulation has been violated, the Health Officer or his/her designated representative may:

- a) Issue a Cease and Desist Order and/or suspend any permit, certificate or other approval issued pursuant to this Regulation to the owner or other party violating this Regulation and afford the owner or other interested party notice and opportunity for hearing.
- b) Request that Ingham County Prosecutors Office or Ingham County Corporation Counsel file a legal action to enjoin the violation. In addition, the Health Officer may seek to recover any and all costs related to correcting, removing or abating the violation.

Issuance of Monetary Civil Penalties

Sec. 710.2 If the Department believes that a person is in violation of a provision of this Regulation or an order issued pursuant to this Regulation, the Department may issue a citation within ninety (90) days after the alleged violation is discovered. The citation shall state with particularity the nature of the violation, including reference to the Section of the Regulation alleged to have been violated, the civil penalty established for such violation, if any, and a right to appeal the citation pursuant to MCL 333.2462 and Section 711 of this Regulation. The citation shall be delivered or sent by registered mail to the alleged violator.

- a) Any party issued a citation may, within twenty (20) days from the date the citation is issued, request an administrative hearing at which time the person may indicate why he/she believes that he/she has not violated this Regulation. After the administrative hearing, the Health Officer may affirm, dismiss, or modify the citation. The decision of the Health Officer shall be final, unless an appeal is filed with the Ingham County Board of Commissioners or its designated committee.
- b) Any party issued a citation may appeal the citation to the Ingham County Board of Commissioners or its designated committee within sixty (60) days after the Health Officer's final decision is issued. The appeal shall be conducted in accordance with Section 711.
- c) A person aggrieved by a final decision of the Health Officer or the Ingham County Board of Commissioners or its designated committee, may petition the Circuit Court of Ingham County for review. The sixty (60) day time period for appeal shall begin to run the day after the date of such final decision.

Schedule of Monetary Civil Penalties

Sec. 710.3 Monetary civil penalties may be imposed according to the following schedule:

- a) First violation: \$200.00
- b) Second violation: \$500.00
- c) Third and subsequent violations each: \$1,000.00

Sec. 710.4 A civil penalty levied under this Section may be assessed for each violation or day that violation continues. The civil penalty may be for a specified violation of this Regulation or promulgated rule that the Health Officer has the authority and duty to enforce.

Sec. 710.5 A decision by the Health Officer not to issue a citation shall not be construed as a waiver of any other rights or remedies authorized by law or this Regulation.

Conviction of Misdemeanor

Sec. 710.6 Any person who violates this Regulation is guilty of a misdemeanor, punishable by imprisonment for not more than ninety (90) days, or a fine of not more than \$200.00 or both. Conviction by jury, court or voluntary plea and acceptance by court under this provision shall not waive any other claim for fines, costs, injunction or other relief authorized by this Regulation. Each day that a violation of this Regulation exists shall constitute a separate offense.

Assessment against the Property

Sec. 710.7 If an owner does not have his/her property evaluated as specified by this Regulation the Department shall cause an inspection to be performed and may charge all costs and fees for the evaluation to the owner of the premises.

Sec. 710.8 If the owner or party violating this Regulation refuses on demand to pay such expenses incurred by the Department to abate, correct or remove a violation, unsanitary condition or nuisance, the sum shall be assessed against the property and shall be collected and treated in the same manner as taxes assessed under the general tax laws of this state.

Right to Obtain Samples

Sec. 710.9 An inspection under Sec.709.2 shall include the right to obtain samples where the Department has reason to believe that there is a likelihood of pollution of surface water, ground water, or water supply. Upon written notice, an owner or occupant of premises from which such inspection is sought shall cooperate with the Department or his/her designated representative.

SECTION 711

Hearings and Appeals

Sec. 711.1 If an owner or interested party is adversely affected by any decision under this Regulation he/she may request in writing a Hearing before the Ingham County Board of Commissioners or its designated committee within thirty (30) days of the date of such decision. The Department shall issue a Notice of Hearing within fifteen (15) days after receiving the request. A Hearing shall then be held at the next regular meeting of the Ingham County Board of Commissioners or its designated committee, scheduled for such purposes; provided, however, that a Hearing shall be conducted no later than sixty (60) days after the Notice of Hearing is mailed to the owner or interested party. The Ingham County Board of Commissioners or its designated committee shall affirm, dismiss or modify the contested decision by a majority vote of the Board or committee. The decision by the Ingham County Board of Commissioners or its designated committee shall be in writing and state the reasons and grounds for such decision. A copy shall be furnished to the owner, any interested person, and the Department within thirty (30) days of the decision.

SECTION 712
Miscellaneous Provisions

Severability

Sec. 712.1 Each provision of this Regulation must be interpreted in a way that is valid under Michigan law. If any provision is held invalid, the rest of the Regulation shall remain in full effect.

Sec. 712.2 All amendments to this Regulation shall be approved by the Ingham County Board of Commissioners after a public hearing required by Section 2442 of Act 368 of the Public Acts of 1978, as amended, has been held before the Board of Health. All amendments shall become effective at a time provided for under Michigan law.

DELHI TOWNSHIP

[Text in *italics* is proposed for addition. Text in ~~strikethrough~~ is proposed for deletion. Text in [BRACKETS] is a comment for discussion. Text underlined is changed from the last draft.]

SECTION 3.3 SITE PLAN REVIEW, APPROVAL AND PERMITS

3.3.1 INTENT AND PURPOSE

The Board of Trustees and the Planning Commission of the Charter Township of Delhi find that commercial, industrial, and multi-family and other nonresidential uses in Delhi Charter Township have a substantial impact upon the character of the community, and upon traffic, utilities and property values therein, thereby affecting the public health, safety, and general welfare thereof. Therefore, in order to foster the attractiveness of the community and to enhance and preserve its desirability as a place to live and to work, and thereby preserve property values, and in order to provide an efficient road and utility network, ensure the movement of traffic, implement comprehensive planning and better serve the public health, safety and general welfare, it is hereby determined that plans for such uses shall be referred to the Planning Commission of the Charter Township of Delhi in accordance with this Section.

3.3.2 SITE PLAN REVIEW

1) **USES SUBJECT TO SITE PLAN REVIEW:** No building shall be erected, moved, externally altered, added to, or have any change in use which would affect its approved off street parking, landscaping, or other requirement, and no building or land shall be used nor any building, grading or occupancy permit shall be issued except in accordance with a plan approved under this Section. Specifically, site plan review shall apply to all new construction, including building additions and accessory uses, for the following:

- a) Multiple family dwellings permitted by right in the RM-1 and RM-2 zoning districts.
- b) Uses permitted by right in the following districts:
 - (1) Commercial (C-1, C-2, C-3, and C-4)
 - (2) Industrial (M-1, M-2, I-W, I-R, I-A, I-M, and I-P)
 - (3) Town Center
- c) Special land uses in all districts.

2) **WAIVER OF SITE PLAN REVIEW:** The Site Plan Review Requirements may be waived by the Zoning for limited projects which have limited potential of causing serious impacts on the land in question, the neighboring properties, or the Community as a whole. The Zoning Administrator shall report all waiver actions to the Planning Commission with detailed information as to the nature of the application and the criteria upon which a waiver is to be granted.

3) MINOR AND MAJOR DEVELOPMENT PROJECTS

- a) **MINOR DEVELOPMENT PROJECTS:** A minor development project, for the purpose of this Section, is defined as follows:
 - (1) Grading, including a cut or fill of less than 50 cubic yards.
 - (2) Remodeling or alteration of an existing commercial or industrial building of less than 10,000 square feet.
 - (3) Additions to existing commercial or industrial buildings of less than 10,000 square feet when such addition is less than 25% of the existing gross square feet of floor area.

Projects which have been determined to be Minor Development Projects are required to be submitted only for Preliminary Site Plan Review.

- b) **MAJOR DEVELOPMENT PROJECTS -** Major development projects are those not listed above, which and include but are not limited to:

- (1) Multiple Family Developments (except duplex units)
- (2) All new nonresidential construction
- (3) Remodeling or alteration of an existing commercial and industrial building of 10,000 square feet or more.
- (4) Additions to existing commercial or industrial buildings of less than 10,000 square feet when such addition is 25% or greater of the existing gross square footage of floor space.
- (5) Additions to existing commercial or industrial buildings of 10,000 square feet or more.

Projects which have been determined to be Major Development Projects are required to be submitted for Preliminary Site Plan Review and for Final Site Plan Review.

3.3.3 REVIEWING AUTHORITY

Site plans shall be reviewed and approved, approved with conditions, or disapproved under the authority of the Planning Commission. Such authority shall include review by the Zoning Administrator in accordance with procedures, requirements, and standards assigned by the Planning commission. The Zoning Administrator, using such qualified assistance as may be necessary, shall be the approving authority of site plans which are defined as Minor Developments. Major Developments shall be reviewed by both the Zoning Administrator and the Planning Commission.

3.3.4 CONCEPTUAL DEVELOPMENT SITE PLAN REVIEW

Applicants are encouraged to submit a Conceptual Development Site Plan for Review by the Planning Commission. The intent of the conceptual Site Plan Review is to minimize errors, miscalculations or misconceptions prior to the submission for Preliminary Site Plan Review. This procedure is intended to be for informational purposes only and shall not necessarily bear directly upon later reviews. Proposed new construction on parcels of land which are undeveloped or are to be redeveloped, or which will be developed in phases, are encouraged to seek this review prior to the submission for preliminary site plan review. The purpose of this is to indicate the general design and layout of the project and to demonstrate the ability to be approved as a site plan.

3.3.5 PRELIMINARY SITE PLAN REVIEW PROCEDURES

Both Minor and Major Development Projects shall require Preliminary Site Plan Review.

- 1) Applications for preliminary site plan review shall be submitted to the Township Zoning Administrator.
- 2) The Zoning Administrator or his designee shall review the Preliminary Site Plan and approve, approve with conditions, or deny the plan, based on compliance of the plan with this Zoning Ordinance of Delhi Charter Township. If denied, reasons for the denial shall be cited. (Also refer to "Appeal" Section 3.3.12). If approved, the applicant may submit a final site plan for the development or phase of the development.
 - a) Minor Development Projects shall be processed by the Zoning Administrator. Notification of the processing of Minor Projects will be forwarded to the Planning Commission for informational purposes. The Zoning Administrator shall report all actions to the Planning Commission with detailed information as to the nature of the application and the criteria upon which an action was taken.
 - b) Major Development Projects shall be processed by the Zoning Administrator and forwarded to, the Planning Commission for action.
- 3) Applications for Preliminary Site Plan approval for all projects (Minor and Major) shall consist the following:
 - a) Application form and appropriate fee as adopted by the Delhi Township Board.
 - b) Two (2) reproducible copies of the Preliminary Site Plan, no larger than 11"x 17", with an appropriate text and graphic scale, shall be submitted with the application.
 - c) Legal description; lot line dimensions and bearings, tax parcel number(s), and address of the Site.
 - d) Name and address of property owner of record and the developer.
 - e) Existing Development
 - (1) Zoning and Property information:
 - (a) Zoning district of site and all adjacent property
 - (b) Land use of the site and adjacent property
 - (c) Proposed use of site.
 - (d) Lot area, in acres and/or square feet, excluding existing road rights of way as well as that in proposed rights of way.
 - (2) Existing deed restrictions, if any.
 - (3) Location and outline of all existing development on the site, such as buildings, drives, parking areas, wells, septic tanks, drain fields, utilities, poles, ditches, underground storage tanks, above ground storage areas, etc.
 - (4) Location, width, and purpose of existing easements.
 - (5) Location of adjacent buildings, drives and parking areas.
 - f) Proposed Development
 - (1) Ground floor and total floor area to be constructed.
 - (2) Floor coverage ratio (ground floor area/lot area).
 - (3) Floor area ratio (total floor area divided by net lot area).
 - (4) Number and types of dwelling units and density, for residential projects.
 - (5) Building height, in feet and number of floors.
 - (6) Number of buildings.
 - (7) Required yards and transition strips (delineated on the plan).
 - (8) Number of parking spaces required and provided with supporting calculations.
 - (9) Size of parking spaces and parking lot aisles.
 - (10) Proposed deed restrictions, if any.
 - (11) Proposed construction and completion dates
 - g) General proposed utility layout for sanitary sewer, water, lighting, and storm water systems.
 - h) Location and screening of trash storage areas.
 - i) *The location and elevations of existing water courses and water bodies, including county drains and manmade surface drainageways, floodplains, and wetlands.*
 - j) *The location and status of any floor drains in existing or proposed structures on the site. The point of discharge for all drains and pipes shall be specified on the site plan.*
 - k) *Location of existing and proposed public water mains, public and private drinking water wells, monitoring wells, irrigation wells, test wells or wells used for industrial processes.*

- l) *Inventory of hazardous substances to be stored, used or generated on-site, presented in a format acceptable to the Township Fire Chief (include CAS numbers). [CAS NUMBER = CHEMICAL ABSTRACT SERVICE NUMBER. THIS IS A UNIQUE NUMBER FOR EVERY CHEMICAL ESTABLISHED BY A COLUMBUS OHIO ORGANIZATION WHICH INDEXES INFORMATION PUBLISHED IN "CHEMICAL ABSTRACTS" BY THE AMERICAN CHEMICAL SOCIETY. IT IS USED (AMONG OTHER PURPOSES) IN MAINTAINING CHEMICAL INVENTORIES USED BY DEQ FOR REGULATORY PURPOSES, BY FIREFIGHTERS FOR FIREFIGHTER RIGHT TO KNOW PURPOSES AND BY PUBLIC SERVICE DEPARTMENTS RESPONSIBLE FOR DISCHARGES INTO STORMWATER OR MUNICIPAL SEWER SYSTEMS. IT IS ONLY REFERRED TO BY THE ACRONYM CAS AND IS NEVER SPELLED OUT. IT COULD BE DEFINED IN THE DEFINITIONS SECTION OF THE ORDINANCE IF DESIRED.]*
- m) *Description and location for any existing or proposed above ground and below ground storage facilities.*
- n) *Descriptions of type of operations proposed for the project and drawings showing size, location, and description of any proposed interior or exterior areas of structures for storing, using, loading or unloading of hazardous substances, hazardous wastes, and/or polluting materials.*
- o) *Delineation of areas on the site which are known or suspected to be contaminated, together with a report on the status of cleanup or closure.*
- p) *Completion of the Environmental Permits Checklist on the form provided by the Zoning Administrator.*

4) Approval of the Preliminary Site Plan is valid for a period of one (1) year. If a final site plan for the development, or any phase of the development, has not been submitted during that period, the approval of the preliminary site plan shall be null and void. Preliminary site plans whose approval has expired shall be required to be resubmitted and be processed as an original approval.

3.3.6 FINAL SITE PLAN REVIEW

Major Development Projects shall require Final Site Plan review.

- 1) Applications for final site plan approval shall be submitted to the Township Zoning Administrator.
- 2) The final site plan for developments which have been proposed in phases shall generally conform to the approved preliminary site plan.
- 3) The Zoning Administrator or his designee shall review the Final Site Plan and application and forward a report, with recommendation for action, to the Township Planning Commission.
- 4) Application for Final Site Plan approval shall consist of the following:
 - a) Application form and appropriate fee as adopted by the Delhi Township Board.
 - b) Ten (10) sets of prints
 - c) Two (2) reproducible copies
 - d) All information required for "preliminary site plan review" as per this section that is applicable to the property or phase of development must also be covered by the "final site plan review".
 - e) Professional seal of the preparer of the plan. The preparer must be licensed by the State of Michigan as either a professional architect, engineer, land surveyor, or landscape architect.
 - f) Vicinity map showing the location of the site, in relation to the nearest cross street and section corner.
 - g) Additional Existing Condition Information
 - (1) Existing topography, at two-foot contour intervals.
 - (2) Centerline, right-of-way dimensions including that proposed for the future, and name of each street bordering the site.
 - (3) Location and type of natural features on or adjacent to the site, such as woods, streams, marshes, wetlands, fence rows, individual trees of 6" or larger caliper when not located in a woods, 100 year flood' hazard area depicted in plan view.
 - (4) Soils information, for sites utilizing onsite septic tanks and drainfields; location and extent of soils that are unbuildable in their natural state because of organic content or water table 1 level
 - (5) Location and overall dimensions of existing structures and drives.
 - (6) Surface type and width of streets adjacent to site; surface elevations of existing street at the intersection of each proposed driveway or street.
 - (7) USGS based bench mark on the site.
 - (8) Existing utilities serving the site location, size, inverts, fire hydrants, gatewells, manholes, and catch basins; location and elevations of ditches, culverts, and bridges adjacent to the site; location of utility poles and lines; location and size of natural gas lines and appurtenances.
 - (9) Natural features to remain.
 - (10) Existing improvements to remain.
 - h) Layout Plan - Showing proposed buildings and other structure locations, dimensions, walks, drives, parking areas, and layout information. Layout Plan shall include:
 - (1) Proposed drives and/or streets, surfaces, rights-of-way, easements, location and type of curbing, length and width of turning lanes; and curve radii.
 - (2) Proposed parking areas - number, size, and location of spaces. Show type of surface, typical cross sections, aisle width, aisle of spaces, location of wheel steps, and number and location of barrier free spaces.
 - (3) Proposed loading areas and service areas.
 - (4) Proposed sidewalks and pedestrian paths location, width, surface type, and typical cross sections.
 - (5) Proposed open space and recreation areas showing location, use, size, and proposed amenities.
 - (6) Proposed fences or screens - locations height, type, and typical details.

- i) Grading and Drainage Plan - With (two (2) foot contour intervals) off-site elevations within approximately 100 feet of the property. Include finish floor elevations, drainage and typical cross sections. Drainage plan shall address natural drainage, storm sewer systems, sub-drainage, and Soil Sedimentation and Erosion Control. Proposed storm drainage systems shall include - location, dimensions, and calculations of storm water detention and retention areas; location, size, calculations, and material type of storm sewers; location and centerline elevations of swales or ditches; inverts; location of manholes and catch basins; direction of flow; drainage patterns; profiles of sewers; detention and retention basins; culverts; swales; ditches; and design basis. Include proposed retaining walls - location, dimensions, materials of wall and fill, typical vertical sections, and design calculations. *Sufficient data regarding site runoff estimates and off-site drainage patterns shall be provided to permit review of feasibility and permanence of drainage detention and/or retention as well as the impact on local surface and groundwater.* The landscape plan, the utilities plan, and the grading and drainage plan may be combined if the required information can reasonably be portrayed.
 - j) Landscape Plan - showing existing plant material to remain; proposed planting, buffer areas, screening, turf, bed areas, and other landscape features; location, type, and size of trees and shrubs. Landscape Plan shall include a Plant List of Proposed plant material including horticultural name of plants, sizes, and details of planting.
 - k) Utilities Plan - showing on site utilities locations including; Sanitary Sewer service, Waterlines, Gas, Electrical Service, Telephone, Cable Television and other pertinent utility information - The utilities plan shall also show proposed site lighting - location, type, height, intensity, direction, and typical details.
- 5) The Zoning Administrator and/or the Planning Commission may require "impact analysis" relative to the effects of the proposed development on the existing traffic capacity of streets, and the proposed development's impact on schools, existing utilities, the environment, or natural features. Other required information shall include but not necessarily be limited to the following:
- a) Phase lines, for projects to be constructed in two or more phases. In phased projects, the zoning information required in section 3.5 preceding, shall be provided for each phase and for the total site.
 - b) Concurrent with the submission of a site plan for review, the Planning Commission may require a site analysis where it is necessary to evaluate the design and development potential of the site, to identify the nature and the effect of existing conditions on design and development for the site, and to determine the site's relation to neighboring properties as well as physical and natural features in the area. The analysis shall show a correlation of the principal characteristics of the development site that will affect the layout and future use of the property, and that is the basis for site plan submitted. The analysis shall be in graphic form and may be supplemented by text.
 - c) Proposed outdoor trash- storage - location, dimensions and typical details of the enclosure. If no outdoor trash storage is intended, the plan shall so state.
 - d) Proposed location of central mailboxes if applicable, or, if individual boxes will be used, a note so stating.
 - e) Proposed identification and advertising signs location; dimensions and area, height, illumination; typical copy.
 - f) Proposed traffic control signs - location, type.
 - g) Evidence of approval by:
 - (1) Michigan Department of Natural Resources wetlands, lakes, streams, dams, floodplain, where applicable.
 - (2) Ingham County Road Commission and/or Michigan Department of Transportation - rights-of-way.
 - (3) Ingham County Drain Commission – drainage districts.
 - (4) Ingham County Health Department - wells, septic systems, Pollution Incident Prevention Plans.
 - h) Proposed building and address number locations, typical copy, dimensions.
- 6) Site condominium projects shall submit a preliminary site plan containing the information required herein, to the extent applicable, in accordance with Section 5.14 of the Zoning Ordinance and shall include all land intended for the site

condominium project. Where buildings or structures are not proposed at the time of review, the location and dimensions of lots, including required yards, shall be provided.

- 7) Any applicant for site plan review may elect to submit a combined preliminary and final site plan.
- 8) The Planning Commission may require an "impact analysis" relative to the effects on the existing traffic capacity of streets, and the proposed development's impact on schools, existing utilities, the environment or natural features. The impact analysis shall be at the expense of the applicant.
- 9) Planning Commission review:
 - a) Except as noted in Section 3.3.5 the Planning Commission shall review the application and final site plan and shall approve, approve with conditions, approve with modifications, or deny the submitted final site plan. If denied, the Planning commission shall cite reasons for denial. If approved, the applicant may submit the necessary plans and documents for a building permit(s).
 - b) The Zoning Administrator shall affix a stamp and/or signature to the approved final site plan.

10) *Standards for site plan approval.* [THIS SECTION IS A REQUIRED COMPONENT FOR USE OF SITE PLAN REVIEW. FOLLOWING ARE THE DELTA TOWNSHIP STANDARDS FOR SITE PLAN REVIEW INCLUDING STANDARDS FOR GROUNDWATER PROTECTION.] *Prior to approving a site plan, the Planning Commission, Township Board, and/or Zoning Administrator, where applicable, shall require that the following standards be satisfied. If these standards and the other requirements noted in this Article or other township ordinances are met, the site plan shall be approved.*

- a. *For uses having frontage and/or access on a regional arterial, the number, design and location of access driveways and other provisions for vehicular circulation shall comply with the requirements of the Ingham County Road Commission.*
- b. *Landscaping, landscape buffers and greenbelts shall be provided and designed in accordance with the provisions of Section 6.10, Landscape Requirements.*
- c. *All elements of the site plan shall be designed to take into account the site's topography, the size and type of plot, the character of adjoining property and the type and size of buildings. The site shall be developed so as not to impede the normal and orderly development or improvement of surrounding property for uses permitted in this Ordinance.*
- d. *The landscape shall be preserved in its natural state, insofar as practical, by removing only those areas of vegetation or making those alterations to the topography which are reasonably necessary to develop the site in accordance with the requirements of this Ordinance.*
- e. *The site plan shall provide reasonable visual and sound privacy for all dwelling units located therein. Fences, walks, barriers and landscaping shall be used, as appropriate, to accomplish these purposes.*
- f. *All buildings or groups of buildings shall be arranged so as to permit necessary emergency vehicle access as required by the Fire Department.*
- g. *A pedestrian circulation system which is separated from the vehicular circulation system may be required. In order to ensure public safety, special pedestrian measures, such as sidewalks, crosswalks, crossing signals and other such facilities may be required in the vicinity of schools, playgrounds, shopping areas and other uses which generate a considerable amount of pedestrian traffic.*
- h. *The arrangement of public or common ways for vehicle and pedestrian circulation shall be connected to existing or planned streets and pedestrian or bicycle pathways in the area. Streets and drives which are part of an existing or planned street pattern serving adjacent development shall be of a width appropriate to the traffic volume they will carry and shall have a dedicated right-of-way equal to that specified in the Township's Comprehensive Plan.*
- i. *All streets shall be developed in accordance with the Township Subdivision Control Ordinance No. 88 and Ingham County Road Commission specifications, unless developed as a private road in accordance with the requirements of Section 6.13.*
- j. *Appropriate measures shall be taken to ensure that removal of surface waters will not adversely affect neighboring properties or the public storm drainage system. Provisions shall be made to*

accommodate storm water, prevent erosion and the formation of dust. The use of detention/retention ponds may be required. Surface water on all paved areas shall be collected at intervals so that it will not obstruct the flow of vehicular or pedestrian traffic or create puddles in paved areas. All on-site storm drainage facilities shall be developed in accordance with the specifications of the Ingham County Drain Commissioner's Office and/or the Township Engineer, as applicable.

- k. Exterior lighting shall be arranged so that it is deflected away from adjacent properties and so that it does not impede the vision of traffic along adjacent streets. Flashing or intermittent lights shall not be permitted.
- l. Properties abutting streets which have right of way deficiencies, as identified in the Comprehensive Plan, shall provide additional right of way to the appropriate agency as determined by the Zoning Administrator. The additional right of way shall be provided to the appropriate agency via written documentation prior to final site plan approval by the Zoning Administrator.
- m. Safe, suitable, and adequate access shall be provided. The following factors shall be considered when determining whether safe and adequate access exists:
 - (a) Generally developments generating more than 500 trips per day shall be required to provide a second access point. Trip generation estimates shall be based upon equations/rates provided in the most recent edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.
 - (b) Topography and natural features surrounding the subject parcel shall be considered.
 - (c) The provision of outlots, stub streets, etc. which may facilitate future access.
 - (d) The likelihood of adjacent properties being developed in the near future such that they could be connected to the subject parcel.
 - (e) Proximity to emergency services.
 - (f) The adequacy of the proposed street intersection in terms of sight distances, spacing, slope, etc.
- n. The project and related improvements shall be designed to protect land and water resources from pollution, including pollution of soils, groundwater, rivers, streams, lakes, ponds, and wetlands.
- o. Stormwater detention, retention, transport, and drainage facilities shall, insomuch as feasible, be designed to use or enhance the natural stormwater system on-site, including the storage and filtering capacity of wetlands, watercourses, and water bodies, and/or the infiltration capability of the natural landscape. Stormwater facilities shall be designed so as not to cause flooding or the potential for pollution of surface or groundwater, on-site or off-site.
- p. General purpose floor drains shall be connected to a public sewer system or an on-site holding tank (not a septic system) in accordance with state, county and municipal requirements, unless a groundwater discharge permit has been obtained from the Michigan Department of Environmental Quality. General purpose floor drains which discharge to groundwater are generally prohibited.
- q. Sites at which hazardous substances, hazardous wastes, or potentially polluting materials are stored, used, or generated shall be designed to prevent spills and discharges of such materials to the air, surface of the ground, groundwater, lakes, streams, rivers or wetlands.
- r. Secondary containment facilities shall be provided for above ground storage of hazardous substances, hazardous wastes, or potentially polluting materials in accordance with state and federal requirements. Above ground secondary containment facilities shall be designed and constructed so that the potentially polluting material cannot escape from the unit by gravity through sewers, drains, or other means, directly or indirectly into a sewer system, or to the waters of the State (including groundwater).
- s. Underground storage tanks shall be registered, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality.
- t. Above ground storage tanks shall be certified, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality.
- u. Bulk storage facilities for pesticides and fertilizers shall be in compliance with requirements of the Michigan Department of Agriculture.

- v. *Abandoned water wells (wells that are no longer in use or are in disrepair), abandoned monitoring wells, and cisterns shall be plugged in accordance with regulations and procedures of the Michigan Department of Environmental Quality and the Ingham County Health Department.*
- w. *State and federal requirements for storage, spill prevention, recordkeeping, emergency response, transport and disposal of hazardous substances, hazardous wastes, liquid industrial waste or potentially polluting materials shall be met. No discharge to surface water or groundwater, including direct and indirect discharges of waste, waste effluent, wastewater, pollutants, or cooling water, shall be allowed without approval from appropriate state, county and local agencies.*

3.3.7 SPECIAL LAND USES

For special land uses, as regulated by Article III, a final site plan shall be submitted within one year of the approval date of the special use permit unless that date is otherwise extended by Delhi Charter Township Planning Commission.

3.3.8 VALIDITY OF FINAL SITE PLANS

1) Approval of final site plan is valid for a period of one (1) year. If actual physical construction of a substantial nature of the improvements included in the approved site plan have not commenced and proceeded meaningfully toward completion during that period, the approval of the final site plan shall be null and void.

2) Upon written application, filed prior to the termination of the one (1) year site plan review/approval period, the Planning commission may authorize a single extension of the time limit for approval of a Final Site Plan for a further period of not more than one (1) year. Such extension shall only be granted based on evidence from the applicant that the development has a likelihood of commencing construction within, but not to exceed, one (1) year extension.

3.3.9 CONFORMANCE PRIOR TO SITE PLAN APPROVAL

Prior to approving a site plan, the Planning Commission, shall require that the site plan conform to the Township Zoning Ordinance, as amended.

3.3.10 CONDITIONS OF APPROVAL

1) As part of an approval to any site plan, the Planning Commission may impose any additional conditions or limitations as in its judgment may be necessary for the protection of the public health, safety, and General welfare.

2) Such conditions shall be related to and ensure that the Site Plan Review requirements of Section 3.3.6 are met.

3) Approval of a site plan, including conditions made as part of the approval, is attached to the property described as part of the application and not to the owner of such property.

4) A record of conditions imposed shall be maintained. The conditions shall remain unchanged unless an amendment to the site plan is approved.

5) A record of the decision of the Planning Commission, the reason for the decision reached and any conditions attached to that decision shall be kept and made part of the minutes of the Planning Commission. The Zoning Administrator where applicable has the final review authority.

6) The Zoning Administrator or his designee shall make periodic investigations of development for which site plans have been approved. Noncompliance with the requirements and conditions of the approved site plan shall constitute grounds for the Planning Commission or Zoning Administrator, whichever had final review/approval authority, to terminate said approval following a hearing, of which the applicant or owner shall be given notice by certified mail.

3.3.11 AMENDMENTS TO APPROVED SITE PLANS

1) Any person who has been granted site plan approval shall notify the Zoning Administrator of any proposed amendment to such approved plan. The Zoning Administrator shall determine whether the proposed amendment constitutes a minor or major amendment based on, but not necessarily limited to, the following:

- a) The addition of land to the legal description of the original site plan approval;
- b) The establishment of another use or uses;
- c) The addition of more sales or service area, or the addition of dwelling units;
- d) An expansion or increase in intensity of use.

2) A major amendment to an approved site plan shall comply with the same filing and review procedures of the original approval. A minor amendment may be approved by the Zoning Administrator.

3.3.12 APPEAL

- 1) An appeal of a Zoning Administrator's decision concerning a minor project development site plan shall be to the Delhi Township Zoning Board of Appeals.
- 2) An appeal of the Planning Commission's decision concerning a Site Plan shall be to the Circuit Court of Ingham County.

D:\word\triground\delhitwp.doc2
7/12/2000

DELTA TOWNSHIP

CHAPTER 19

SITE PLAN REVIEW (Amended 12/19/94)

[Text in *italics* is proposed for addition. Text in ~~strikethrough~~ is proposed for deletion. Text underlined is new from the last draft.]

SECTION 19.1.0 INTENT.

It is the intent of this Chapter to require site plan review approval for certain buildings, structures, and uses that can be expected to have a significant impact on natural resources, traffic patterns, adjacent parcels, and the character of future development.

SECTION 19.2.0 USES SUBJECT TO SITE PLAN REVIEW.

- A. Preliminary site plan review by the Planning Commission or Township Board is required for the following if the subject parcel has a gross site area greater than two (2) acres in size:
 - (1) Multiple family dwellings permitted by right in the RD and RE zoning districts.
 - (2) Uses permitted by night in the following districts:
 - (a) Office District (0);
 - (b) Local Service Commercial District (B-1);
 - (c) Community Commercial District (B-2);
 - (d) Limited Industrial District 4-1);
 - (e) General Industrial District 4-2);
 - (3) Special land uses in all districts, except that home occupations, functional family dwellings, bed and breakfast establishments, group day care homes, foster care group homes, and roadside stands shall only be subject to the provisions of Section 19.4.0 A. (1), (2), (a), excluding contours at two foot intervals, (b), (c), and (3). (Amended 6/19/95)
- B. Site plans, not required to be reviewed by the Planning Commission or Township Board, shall be subject to final site plan review by the Zoning Administrator. The Zoning Administrator shall review such plans in accordance with the same procedures, requirements, and standards used by the Planning Commission and Township Board.
- C. Site plan review is a multi-stage process typically consisting of a pre-application conference with the Zoning Administrator, preliminary site plan review by the Planning Commission and/or Township Board, and final site plan review by the Zoning Administrator. The pre-application conference is optional and any applicant for site plan review may elect to proceed directly to preliminary site plan review or final site plan review, as applicable.
- D. Upon receipt of an application for site plan review, at least one sign shall be posted on the subject parcel visible to passersby which describes the general nature of the proposed development, if and when the request will be considered by the Planning Commission, and where comments and questions will be received concerning the proposed development.
- E. Upon receipt of an application for site plan for a review, the Zoning Administrator shall distribute copies of the site plan for review by the appropriate Township, County, State, and/or Federal agencies listed in Section 19. 11.0 B.

- F. The cleaning, grading, and balancing of land may commence absent site plan review if all necessary permits have been obtained from the appropriate State or local agencies. The property owner(s) or developer(s) proceed at their own risk despite having a Soil Erosion Permit, due to the fact that subsequent reviews may necessitate modifications to the grades. If deemed necessary, a Soil Erosion and Sedimentation Permit shall be obtained from the Eaton County Drain Commissioner. If regulated floodplains and/or wetlands are located on the property, the applicable permits shall be obtained from the Michigan Department of Natural Resources.

SECTION 19.3.0 PRE-APPLICATION CONFERENCE. (Optional)

Any site plan review applicant may schedule an informal conference with the Zoning Administrator. At the conference, the relevant requirements of the Township's Zoning Ordinance, Comprehensive Plan, and other development policies and regulations will be explained, as well as key issues which should be addressed by the applicant. Site plan submission requirements, review procedures, and expected timeframes will be outlined. The applicable functions of the Planning Commission, Township Board, Zoning Board of Appeals, and other Township and governmental agencies will be explained. An applicant may also schedule a conference with the Township Engineer for a preliminary discussion of utilities, drainage, and related engineering issues.

SECTION 19.4.0 PRELIMINARY SITE PLANS.

A. Applications for preliminary site plan approval shall consist of the following:

- (1) An application form supplied by the Zoning Administrator.
- (2) A reproducible mylar copy of a preliminary site plan at a scale of not less than one (1) inch equals one hundred (100) feet on a sheet not less than 18 " x 24" or larger than 24 " x 36" with the following minimum information:
 - (a) Legal description of site, dimensions of site boundary lines, total site area, contours at two foot intervals; and locations of all buildings, driveways, parking areas; and other structures on adjacent properties within one hundred (100) feet of the property, including those located across the street from the property.
 - (b) Required and proposed building setbacks, and if applicable, distances between buildings on the site.
 - (c) Location of abutting streets and proposed alignment of streets, drives and easements serving the development, including existing rights-of-way and pavement widths.
 - (d) Use, location, dimensions, floor areas, heights, and total lot coverage percentage of all proposed buildings and structures. If the site plan is for multiple family dwellings, the floor areas for each type of unit shall also be indicated.
 - (e) Use, location, dimensions, and applicable screening of accessory structures such as trash and recycling receptacles, utility pads, storage/utility sheds, etc. Rooftop or outdoor appurtenances should also be indicated, including proposed methods of screening such equipment, where appropriate.
 - (f) Location and dimensions of parking areas, including computations of parking requirements, typical parking space dimensions (including handicapped spaces), and aisle widths. The location, dimensions, and screening of off-street loading/unloading spaces shall also be depicted, if applicable.
 - (g) ~~Proposed water supply and~~ *Location of existing and proposed public water mains, public and private drinking water wells, monitoring wells, irrigation wells, test wells or wells used for industrial processes. Location of proposed wastewater systems locations and sizes. Location and status of any floor drains in existing or proposed structures on the site. The point of discharge for all drains and pipes shall be specified.*
 - (h) *The location and elevations of existing water courses and water bodies, including county drains and manmade surface drainageways, and wetlands. Proposed grades and site drainage patterns (including direction of flow) ~~, including necessary drainage structures.~~ Proposed stormwater management plan including design of sewers, outlets, and ~~retention or detention ponds.~~ Sufficient data regarding site runoff estimates and off-site drainage patterns shall be provided to permit review of feasibility and permanence of drainage detention, and/or ~~retention~~ as well as the impact on local surface and groundwater. Where applicable, indicate the location and elevation(s) of the 100-year floodplain.*
 - (i) Proposed common open spaces and recreational facilities, if applicable.
 - (j) Proposed landscaping, including quantity, size at planting and botanical, and common names of plant materials.
 - (k) Signs, including locations and sizes.
 - (l) Location and dimensions of all access drives, including driveway dimensions, pavement markings, traffic control signs or devices, and service drives.

- (m) Exterior lighting showing area of illumination and indicating the type of fixture to be used.
 - (n) Number of employees in the largest working shift for the proposed use, if applicable.
 - (o) North arrow, legend, graphic and written scale, and title block containing the project name.
 - (p) The name and address of the person and firm who drafted the plan, the seal of the professional (licensed in the State of Michigan) responsible for the accuracy of the plan and the date on which the plan was prepared.
 - (q) *Delineation of areas on the site which are known or suspected to be contaminated, together with a report on the status of cleanup or closure.*
 - (r) *Inventory of hazardous substances to be stored, used or generated on-site, presented in a format acceptable to the Township Fire Chief (include CAS numbers). [CAS NUMBER = CHEMICAL ABSTRACT SERVICE NUMBER. THIS IS A UNIQUE NUMBER FOR EVERY CHEMICAL ESTABLISHED BY A COLUMBUS OHIO ORGANIZATION WHICH INDEXES INFORMATION PUBLISHED IN "CHEMICAL ABSTRACTS" BY THE AMERICAN CHEMICAL SOCIETY. IT IS USED (AMONG OTHER PURPOSES) IN MAINTAINING CHEMICAL INVENTORIES USED BY DEQ FOR REGULATORY PURPOSES, BY FIREFIGHTERS FOR FIREFIGHTER RIGHT TO KNOW PURPOSES AND BY PUBLIC SERVICE DEPARTMENTS RESPONSIBLE FOR DISCHARGES INTO STORMWATER OR MUNICIPAL SEWER SYSTEMS. IT IS ONLY REFERRED TO BY THE ACRONYM CAS AND IS NEVER SPELLED OUT. IT COULD BE DEFINED IN THE DEFINITIONS SECTION OF THE ORDINANCE IF DESIRED.]*
 - (s) *Descriptions of type of operations proposed for the project and drawings showing size, location, and description of any proposed interior or exterior areas of structures for storing, using, loading or unloading of hazardous substances, hazardous wastes, and/or polluting materials including the location of any existing or proposed above ground and below ground storage facilities.*
 - (t) *Completion of the Environmental Permits Checklist on the form provided by the Zoning Administrator.*
- (3) The Planning Commission and/or Township Board, as applicable, may require written statements relative to the impact on existing utilities, natural features, or the environment.

B. Planning Commission Review:

- (1) Except as noted in Section 19.5.0, the Planning Commission shall review the application and preliminary site plan and shall approve, approve with conditions or deny the submitted site plan, or, in the case of those site plans requiring Township Board review as noted in Section 19.5.0, recommend such action. If denied, the Planning Commission shall cite reasons for denial. If approved, the applicant may submit the site plan to the Zoning Administrator for final site plan review.
- (2) The public, staff, and Township decision-makers shall be provided adequate time to consider and review a site plan prior to a public meeting regarding that site plan. The Planning Commission or Township Board may postpone deliberation of a plan if, in its opinion, the site plans have recently been modified such that insufficient time has been provided for adequate review and analysis of the plans. If changes to the site plan have been made within 10 days of the Planning Commission meeting at which they are to be considered, a member of the public may request postponement of deliberations so that additional review and analysis may be conducted.

SECTION 19.5.0 TOWNSHIP BOARD REVIEW OF PRELIMINARY SITE PLANS FOR CERTAIN SPECIAL LAND USES.

A. The Township Board shall also review the preliminary site plans for the following special land uses:

- (1) Public and private sanitary landfills.
- (2) Planned unit developments.
- (3) Condominium subdivisions.
- (4) Mobile home parks.
- (5) Regional shopping centers.
- (6) Refuse, garbage, and other incinerators.

- B. The Planning Commission shall transmit the results of their review of the preliminary site plan for the special land uses identified in Section 19.5.0 A. to the Township Board. The Township Board shall approve, approve with conditions, or deny the submitted site plan. Reasons for denial shall be set forth in writing. The applicant shall be provided with a copy of the resolution of the Township Board regarding the preliminary site plan.

SECTION 19.6.0 APPEALS OF PRELIMINARY SITE PLANS.

A. Eligibility:

- (1) Any person aggrieved by the decision of the Planning Commission or the Township Board in granting or denial of preliminary site plan approval, or the Zoning Administrator in granting or denial of final site plan approval, shall have the right to appeal the decision to the Zoning Board of Appeals.
- (2) An aggrieved party must allege and prove to the satisfaction of the Zoning Board of Appeals that he or she has suffered, or may suffer, some special damages not common to other property owners similarly situated. The mere increase in traffic in the area, proof of general economic and aesthetic losses, or the mere fact that the appellant owns adjacent property are not sufficient to show special damages.

B. Appeals Process:

- (1) The appeal shall state the aggrieved parties' grounds for appeal and shall be filed with the Township Clerk within seven (7) days of the decision of the Planning Commission, Township Board, or Zoning Administrator.
- (2) The Zoning Administrator shall transmit to the Board of Appeals copies of all documents constituting the record of the site plan review.
- (3) The Zoning Board of Appeals shall review the appellant's documents and determine if they are an aggrieved party.
 - (a) If the Board determines that the appellant(s) is not an aggrieved party, the Board shall note their findings in resolution form, state their reasons, and inform the appellant(s) in writing.
 - (b) If the Board determines that the appellant(s) is an aggrieved party, the Board shall note their findings in resolution form, state their reasons and schedule a meeting date to consider whether to confirm or overturn the original decision.
- (4) The Zoning Board of Appeals shall review the public record and determine whether or not there was support on the record for the original decision. The appellant shall not have the right to present new evidence, but shall be bound by the record. The appellant and the appellee may present oral arguments pertaining to the record. The extent of the oral arguments shall be at the discretion of the Chairman. The Board of Appeals shall decide upon all site plan appeals within a reasonable time, not to exceed forty five (45) days from the date on which the appeal was filed.
- (5) The Zoning Board of Appeals shall approve the site plan if the requirements of this chapter and other applicable Township Ordinances are met.

- C. **Stay:** The filing of a site plan appeal shall act to stay the issuance of a final site plan approval, issuance of any Certificates of Zoning Compliance, or the issuance of any building permit authorizing improvements on the property which is the subject of the appeal.

SECTION 19.7.0 VALIDITY OF PRELIMINARY SITE PLANS.

- A. Approval of the preliminary site plan is valid for a period of one (1) year. If a final site plan for the development, or for any phase of the development, which meets the requirements of Section 19.8.0 has not been submitted during that period, the approval of the preliminary site plan shall be null and void.
- B. Upon written application, filed prior to the termination of the one (1) year review period, the Planning Commission may authorize a single extension of the time limit for approval of a preliminary site plan for a further period of not more than one (1) year. Such extension shall only be granted based on evidence from the applicant that the development has a likelihood of commencing construction within the one (1) year extension. In those instances where the Township Board has preliminary site plan review authority, the Township Board shall determine whether an extension is warranted.

SECTION 19.8.0 FINAL SITE PLANS.

- A. Applications for final site plan approval shall conform to the same submission requirements as those set forth for preliminary site plans in Section 19.4.0 A.
- B. The final site plan shall conform to the approved preliminary site plan and shall incorporate those revisions and conditions stipulated by the Planning Commission and/or Township Board in approving the site plan.
- C. Zoning Administrator Review:

- (1) The Zoning Administrator shall review the application and final site plan and shall approve, approve with conditions, or deny the submitted plan. If denied, the Zoning Administrator shall cite reasons for denial. If approved, the applicant may submit the necessary plans and documents for a building permit(s).
- (2) The applicant shall submit one (1) reproducible copy and four (4) paper copies of the approved final site plan to the Zoning Administrator. The paper copies shall be signed, sealed, and dated by the professional (licensed in the State of Michigan) responsible for the accuracy of the plan.
- (3) The Zoning Administrator shall affix a stamp and signature to the approved final site plan.
- (4) Appeals of a decision of the Zoning Administrator pertaining to final site plan approval or denial shall be made to the Township Zoning Board of Appeals.

SECTION 19.9.0 VALIDITY OF FINAL SITE PLANS.

- A. Approval of the final site plan is valid for one (1) year. If actual physical construction of a substantial nature of the on-site utility systems and/or building improvements included in the approved site plan has not commenced and proceeded meaningfully toward completion during that period, the approval of the final site plan shall be null and void.
- B. Final site plans whose approval has expired shall be required to be resubmitted and processed as an original application.

SECTION 19.10.0 STANDARDS FOR SITE PLAN APPROVAL.

- A. Prior to approving a site plan, the Planning Commission, Township Board, and/or Zoning Administrator, where applicable, shall require that the following standards be satisfied. If these standards and the other requirements noted in this Chapter or other township ordinances are met, the site plan shall be approved.
 - (2) For uses having frontage and/or access on a regional arterial, the number, design and location of access driveways and other provisions for vehicular circulation shall comply with the provisions of Chapter 21, ACCESS MANAGEMENT REGULATIONS.
 - (3) Landscaping, landscape buffers and greenbelts shall be provided and designed in accordance with the provisions of Chapter 20, LANDSCAPE STANDARDS.
 - (4) All elements of the site plan shall be designed to take into account the site's topography, the size and type of plot, the character of adjoining property and the type and size of buildings. The site shall be developed so as not to impede the normal and orderly development or improvement of surrounding property for uses permitted in this Ordinance.
 - (5) The landscape shall be preserved in its natural state, insofar as practical, by removing only those areas of vegetation or making those alterations to the topography which are reasonably necessary to develop the site in accordance with the requirements of this Ordinance.
 - (6) The site plan shall provide reasonable visual and sound privacy for all dwelling units located therein. Fences, walks, barriers and landscaping shall be used, as appropriate, to accomplish these purposes.
 - (7) All buildings or groups of buildings shall be arranged so as to permit necessary emergency vehicle access as required by the Fire Department.
 - (8) A pedestrian circulation system which is separated from the vehicular circulation system may be required. In order to ensure public safety, special pedestrian measures, such as sidewalks, crosswalks, crossing signals and other such facilities may be required in the vicinity of schools, playgrounds, shopping areas and other uses which generate a considerable amount of pedestrian traffic.
 - (9) The arrangement of public or common ways for vehicle and pedestrian circulation shall be connected to existing or planned streets and pedestrian or bicycle pathways in the area. Streets and drives which are part of an existing or planned street pattern serving adjacent development shall be of a width appropriate to the traffic volume they will carry and shall have a dedicated right-of-way equal to that specified in the Township's Comprehensive Plan.
 - (10) All streets shall be developed in accordance with the Township Subdivision Control Ordinance and Eaton County Road Commission specifications, unless developed as a private road in accordance with the requirements of Section 3.2.0.
 - (11) Appropriate measures shall be taken to ensure that removal of surface waters will not adversely affect neighboring properties or the public storm drainage system. Provisions shall be made to accommodate storm water, prevent erosion and the formation of dust. The use of detention/retention ponds may be required. Surface water on all paved areas shall be collected at intervals so that it will not obstruct the flow of vehicular or pedestrian traffic or create puddles in paved areas. All on-site storm drainage facilities shall be developed in

accordance with the specifications of the Eaton County Drain Commissioner's Office and/or the Township Engineer, as applicable.

- (12) Exterior lighting shall be arranged so that it is deflected away from adjacent properties and so that it does not impede the vision of traffic along adjacent streets. Flashing or intermittent lights shall not be permitted.
- (13) Properties abutting streets which have right of way deficiencies, as identified in the Comprehensive Plan, shall provide additional right of way to the appropriate agency as determined by the Zoning Administrator. The additional right of way shall be provided to the appropriate agency via written documentation prior to final site plan approval by the Zoning Administrator.
- (14) Safe, suitable, and adequate access shall be provided. The following factors shall be considered when determining whether safe and adequate access exists:
 - (a) Generally developments generating more than 500 trips per day shall be required to provide a second access point. Trip generation estimates shall be based upon equations/rates provided in the most recent edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.
 - (b) Topography and natural features surrounding the subject parcel shall be considered.
 - (c) The provision of outlots, stub streets, etc. which may facilitate future access.
 - (d) The likelihood of adjacent properties being developed in the near future such that they could be connected to the subject parcel.
 - (e) Proximity to emergency services.
 - (f) The adequacy of the proposed street intersection in terms of sight distances, spacing, slope, etc.
- (15) *The project and related improvements shall be designed to protect land and water resources from pollution, including pollution of soils, groundwater, rivers, streams, lakes, ponds, and wetlands.*
- (16) *Stormwater detention, retention, transport, and drainage facilities shall, insomuch as feasible, be designed to use or enhance the natural stormwater system on-site, including the storage and filtering capacity of wetlands, watercourses, and water bodies, and/or the infiltration capability of the natural landscape. Stormwater facilities shall be designed so as not to cause flooding or the potential for pollution of surface or groundwater, on-site or off-site.*
- (17) *General purpose floor drains shall be connected to a public sewer system or an on-site holding tank (not a septic system) in accordance with state, county and municipal requirements, unless a groundwater discharge permit has been obtained from the Michigan Department of Environmental Quality. General purpose floor drains which discharge to groundwater are generally prohibited.*
- (18) *Sites at which hazardous substances, hazardous wastes, or potentially polluting materials are stored, used, or generated shall be designed to prevent spills and discharges of such materials to the air, surface of the ground, groundwater, lakes, streams, rivers or wetlands.*
- (19) *Secondary containment facilities shall be provided for above ground storage of hazardous substances, hazardous wastes, or potentially polluting materials in accordance with state and federal requirements. Above ground secondary containment facilities shall be designed and constructed so that the potentially polluting material cannot escape from the unit by gravity through sewers, drains, or other means, directly or indirectly into a sewer system, or to the waters of the State (including groundwater).*
- (20) *Underground storage tanks shall be registered, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality.*
- (21) *Above ground storage tanks shall be certified, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality.*
- (22) *Bulk storage facilities for pesticides and fertilizers shall be in compliance with requirements of the Michigan Department of Agriculture.*
- (23) *Abandoned water wells (wells that are no longer in use or are in disrepair), abandoned monitoring wells, and cisterns shall be plugged in accordance with regulations and procedures of the Michigan Department of Environmental Quality.*
- (24) *State and federal requirements for storage, spill prevention, recordkeeping, emergency response, transport and disposal of hazardous substances, hazardous wastes, liquid industrial waste or potentially polluting materials shall be met. No discharge to surface water or groundwater, including direct and indirect discharges of waste, waste effluent, wastewater, pollutants, or cooling water, shall be allowed without approval from appropriate state, county and local agencies.*

SECTION 19.1 1.0 CONDITIONS OF APPROVAL.

- A. As part of an approval to any site plan, the Planning Commission, or Township Board, as applicable, may impose any additional conditions or limitations as in its judgment may be necessary for protection of the public interest. Such conditions shall be related to and ensure that the review standards of Section 19.10.0 are met.

- B. The Zoning Administrator shall not approve the final site plan until the plan has been reviewed and approved by all applicable Township, County, State and Federal agencies. Such agencies may include, but shall not be limited to, the following:
 - (1) Township Engineer
 - (2) Township Fire Chief
 - (3) Township Utilities Director
 - (4) Eaton County Road Commission
 - (5) Eaton County Drain Commissioner
 - (6) Barry-Eaton District Health Department
 - (7) Michigan Department of Transportation
 - (8) Michigan Department of Natural Resources
 - (9) Michigan Department of Public Health
 - (10) Michigan Department of Environmental Quality.

- C. Approval of a site plan, including conditions made as part of the approval, is attached to the property described as part of the application and not to the owner of such property.

- D. A record of the decision of the Planning Commission, the reason for the decision reached and any conditions attached to such decision shall be kept and made a part of the minutes of the Planning Commission. A similar record shall also be kept by the Township Board in those instances where they have preliminary site plan review authority. The conditions shall remain unchanged unless an amendment to the site plan is approved.

- E. Installation of public water or private water or sanitary sewer mains shall not be commenced prior to the Zoning Administrator's approval of the final site plan.

- F. The Zoning Administrator may make periodic investigations of developments for which site plans have been approved. Non-compliance with the requirements and conditions of the approved site plan shall constitute grounds for the Planning Commission or Township Board, whichever had final review authority, to terminate said approval following a public hearing.

SECTION 19.12.0 AMENDMENTS TO APPROVED SITE PLANS.

- A. Any person who has been granted final site plan approval shall notify the Zoning Administrator of any proposed amendment to such approved plan. The Zoning Administrator shall determine whether the proposed amendment constitutes a minor or major amendment based on, but not necessarily limited to, the following:
 - (1) the addition of land to the legal description of the original site plan approval;
 - (2) the establishment of another use or uses;
 - (3) the addition of more sales or service area, or the addition of dwelling units;
 - (4) an expansion or increase in intensity of use;

- B. A major amendment to an approved final site plan shall comply with the same filing and review procedures of the original approval, including preliminary site plan review by the Planning Commission and/or Township Board if originally required for the development. A minor amendment may be approved by the Zoning Administrator.

CITY OF EAST LANSING

Dave Smith: When we meet to go over this, please be sure that someone familiar with the details of the zoning ordinance is present. Thanks.

[Text in *italics* is proposed for addition. Text in ~~strike through~~ is proposed for deletion. Text in [BRACKETS] is a comment for discussion.]

Following are excerpts of relevant provisions dealing with site plans and review of proposed “development plans” with proposed modifications to protect groundwater resources.

5.5

- (48) SITE PLAN:** means an accurate plan at a scale of at least one (1) inch to one hundred (100) feet which covers at least one (1) lot and specifies the site, proposed use, exact structure locations, structure (including sign) elevations and dimensions, pedestrian and vehicular circulation, parking facilities, loading facilities, lighting, proposed grading (topography) at a maximum of two (2) foot contour levels and proposed schedule for development; and shall include surrounding existing conditions within fifty (50) feet beyond the property lines so as to show existing grades and contours, vegetation, retaining walls, and other man-made and physical features which may affect the proposed development. Similar, related data may be required when relevant to City's evaluation. *The following additional information shall also be provided:*
- (a) *Existing topographic elevations at two (2) foot contour intervals. Indicate direction of drainage flow.*
 - (b) *The location and elevations of existing water courses and water bodies, including county drains and manmade surface drainageways, floodplains, and wetlands.*
 - (c) *Proposed stormwater management plan including design of sewers, outlets, and retention or detention ponds. Sufficient data regarding site runoff estimates and off-site drainage patterns shall be provided to permit review of feasibility and permanence of drainage detention and/or retention as well as the impact on local surface and groundwater.*
 - (d) *The location and status of any floor drains in existing or proposed structures on the site. The point of discharge for all drains and pipes shall be specified on the site plan.*
 - (e) *Location for on-site wastewater treatment and disposal systems.*
 - (f) *Location of existing and proposed public and private drinking water wells, monitoring wells, irrigation wells, test wells or wells used for industrial processes.*
 - (g) *Inventory of hazardous substances to be stored, used or generated on-site, presented in a format acceptable to the local fire marshal (include CAS numbers).*
 - (h) *Descriptions of type of operations proposed for the project and drawings showing size, location, and description of any proposed interior or exterior areas of structures for storing, using, loading or unloading of hazardous substances, hazardous wastes, and/or polluting materials.*
 - (i) *Description and location for any existing or proposed above ground and below ground storage facilities.*
 - (j) *Delineation of areas on the site which are known or suspected to be contaminated, together with a report on the status of cleanup or closure.*
 - (k) *Completion of the Environmental Permits Checklist on the form provided by the Zoning Administrator.*

[NOTE: THE ABOVE SITE PLAN DEFINITION APPEARS TO INCLUDE THE ONLY “SUBMITTAL REQUIREMENTS”. THESE ARE EXTREMELY LIMITED. LISTED ABOVE ARE ADDITIONS THAT ARE NECESSARY TO IMPLEMENT THE GROUNDWATER PROTECTION PROVISIONS, BUT IT MAY ALSO BE DESIRABLE FOR THE CITY TO ADD OTHER, STANDARD SUBMITTAL REQUIREMENTS AS WELL. PLEASE ADVISE IF YOU WANT SAMPLES OF MORE “TYPICAL” STANDARDS.]

5.105 PAVING PERMIT. No part of any yard or premises shall be paved or repaved for the purposes of providing vehicular parking or access unless a paving permit is first issued by the Building Official as described in this Section.

- (1) Definitions. For the purposes of this Section, the following definitions shall apply:
- (a) Pave, and its derivatives, shall mean the placement of materials on the ground for the purposes of providing vehicular parking or access including, but not limited to, concrete, gravel, bituminous material, crushed stone, tile, or brick pavers
 - (b) Pavement reconstruction shall mean the replacement of the existing paved surfaces, or the supplementation of existing paving materials, or the placement of a new type of surface material over an existing paved surface
 - (c) Pavement expansion shall mean the extension of the existing boundaries of the paving on a premise
 - (d) Pavement Maintenance shall mean the minor repair and routine maintenance of existing paving, including applying surface sealers and patches, filling cracks and potholes, and raking and leveling loose paving materials

(2) Permit application. Application for this paving permit shall be made to the Department of Code Enforcement and Neighborhood Conservation and shall include an accurate site plan or survey of the lot for which the permit is sought, showing:

- (a) The dimension of each side of the lot

- (b) The boundaries, with dimensions, of existing and proposed paving on the lot and the location and dimensions of parking spaces
- (c) The location and dimensions of any buildings or other structures on the lot
- (d) The nature of the paving material or materials to be used and the nature of adjacent ground cover
- (e) A landscape plan if required under 5.106(8)(b)

(3) Permit issuance. The paving permit shall identify the property upon which the paving is to be done and describe the specific area which is to be paved and the type of surface to be used. The paving permit shall be posted in a conspicuous location on the lot during the paving operation. No paving permit shall be issued to place new paving, or paving expansion, unless all parking and access facilities on the property meet the standards in this Chapter and the standards of Chapter 43 of the City Code.

(4) Nonconforming paving. A paving permit may be issued to reconstruct a driveway or paving space which legally exists at the time of adoption of this provision. When such paving, or any portion thereof, can feasibly be done in greater conformity with the Zoning Ordinance in the opinion of the Planning and Zoning Official, the Building Official shall so require in any paving permit.

In determining such feasibility, the following provisions shall apply:

- (a) The reconstruction shall not increase or extend any existing nonconformity
- (b) The reconstruction shall not cause or permit a change in the occupancy or use of the property, and
- (c) The reconstruction shall not increase the number of parking spaces provided on the property

5.107 PARKING AND ACCESS PLAN AND LANDSCAPE PLAN.

(1) Defined.

(a) Parking and Access Plan. A plan showing building location ingress and egress, access ways, parking spaces, maneuvering areas, landscape areas, paving, proposed grading (topography) at a maximum of two (2) foot contour levels, fencing, curb cuts, and lighting, or other arrangements as may be required; and shall include surrounding existing conditions within fifty (50) feet beyond the property lines so as to show existing grades and contours, vegetation, retaining walls, and other physical features which may affect the landscape plan.

(b) Landscape Plan. A plan prepared by a Landscape Architect registered in the State of Michigan showing the type, height, and placement of all materials and including a grading plan. The grading plan shall be prepared by an engineer, architect, landscape architect, or land surveyor registered in the State of Michigan.

NOTE: The requirements of this subsection regarding grading and/or contour plans may be incorporated with requirements elsewhere in this Code, e.g., Chapter 102, Grading and Soil Erosion Control and/or Chapter 98, General Building Regulations.

(2) When required. No person shall construct a parking lot if landscaping is required in accordance with Section 5.106(11) without first submitting a Parking and Access Plan and a Landscape Plan and receiving approval thereof.

(3) Submission and approval.

(a) All uses required to submit development plans for approval in accordance with Section 5.42 or Section 5.147A shall submit and receive approval of a Parking and Access Plan and Landscape Plan as part of that required site plan approval.

(b) A Parking and Access Plan and Landscape Plan for all other uses shall be submitted to the Planning and Zoning Official and comply with the site plan approval procedures of Section 5.147.

5.147A PLAN OF DEVELOPMENT.

(1) Definitions. A Plan of Development means a plan for the erection, enlargement, extension, or reconstruction of those buildings or for the establishment, expansion or conversion of those uses required by Articles II, III, IV, V, VI, VIII, IX, X, XI, XI-A, XI-B, XII, XIII, and Section 5.147A to have an approved Plan of Development.

(2) When Required. An approved Plan of Development shall be required for the construction of all uses as specified in the Use District Regulations of this Chapter. Except as otherwise provided in the Use District Regulations, an approved Plan of Development shall also be required for the expansion or conversion of such uses which would result in an increased parking requirement as determined in accordance with Section 5.102 of this Chapter. The Planning and Zoning Official may waive this requirement for expansions which would not increase the scale or intensity of the use and not represent an increase in total floor area of a building of more than ten percent (10%) or five hundred (500) square feet, whichever is less. No certificate of occupancy and no building permit for the erection, enlargement, or extension of a building or structure shall be granted by the Building Official unless the required Plan of Development has been approved in accordance with the requirements set forth in this Section.

3) Submission of Plans. Five (5) copies of plans to be reviewed shall be submitted to the Planning and Zoning Official. Such plans shall include, but are not limited to, a Site Plan as defined in Section 5.5(48) and a Parking and Access Plan and a Landscape Plan as required in Section 5.107. Although review of preliminary plans is

not required, applicants may submit such plans to the Planning and Zoning Official for review and comment at any time prior to the preparation of final plans and the submission of such plans as required herein.

(4) Review by Planning and Zoning Official. After an application for a building permit or certificate of occupancy accompanied by the required plans as set forth in Paragraph (3) above has been submitted, the Planning and Zoning Official shall conduct a preliminary review of the plans and within fifteen (15) working days shall notify the applicant of any deficiencies in relation to the requirements of this Chapter. Upon receipt of final plans, the Planning and Zoning Official shall review them and recommend approval, rejection, or modifications within five (5) working days from the date of receipt thereof. The Planning and Zoning Official shall recommend approval of the Plan of Development if it meets the standards for development of the use district in which it is to be located, is consistent with the objectives of the Comprehensive Plan as approved and amended by the Planning Commission, and it meets the following criteria. The Planning and Zoning Official may also recommend approval of the Plan subject to certain modifications necessary to bring the Plan into conformance with the Use District Regulations, the objectives of the Comprehensive Plan, or the following criteria.

(a) Preservation of landscape. The natural landscape of the site shall be preserved by retaining mature, healthy trees and natural topography of building sites, recreation areas, required parking and driveway areas, drainage facilities, and utility systems. Appropriate ground cover, trees, and other vegetative materials shall be retained or planted to prevent excessive storm water runoff, erosion, siltation, and dust, and to enhance the general appearance of the site.

(b) Arrangement of buildings and spaces.

i. Buildings shall be located on the site or designed in such a manner that the fronts of buildings containing dwelling units do not face into rear yards or service areas of other buildings located either within the site or adjacent to it, except where privacy walls, fences, plant materials, or topographic features provide screening therefrom.

ii. Where a site to be developed for residential (including hotel and motel) use abuts a major thoroughfare, expressway, railroad, or another site developed or intended to be developed for uses potentially incompatible with residential uses, the building and open spaces shall be so located, designed, and arranged as to provide reasonable separation from such features or uses. Where necessary to achieve such separation, trees or other vegetative materials shall be retained on the site or supplemented by additional planting or the erection of appropriate walls or fences.

(c) Function of yards, contours, and spaces. Yards, spaces between buildings, open spaces, spaces adjacent to streets, ground contours, and livability space shall be located with respect to buildings and other site improvements and shall be improved so as to reasonably serve the purposes for which such yards, contours, and spaces are intended by this Chapter, those purposes being: provision of light and air, separation between buildings, separation between incompatible functions, separation from streets, enhancement of privacy, retention, and provision of natural vegetation, enhancement of urban aesthetics, and the promotion of public health and safety. Green spaces with trees, bushes, or other plantings may also be regulated in large parking areas as necessary and consistent with prudent development to achieve the purposes of this Chapter and specifically to achieve the purposes set forth in this subdivision (c). Any such requirement shall not be less than those required by Section 5.106.

(d) Parking and circulation.

i. Driveways and areas for the parking and circulation of vehicles shall be located, designed, and improved so as to provide for safe and convenient circulation within the site, safe and convenient ingress and egress from the site, safe and convenient vehicular and pedestrian flow on adjacent streets, and shall be in accordance with established traffic engineering standards and practices. Among factors to be considered shall be the number and location of access drives from and to adjacent streets, the location and width of driveways and access aisles to parking spaces, the arrangement of parking areas, and the means of access to buildings for firefighting apparatus and other emergency vehicles.

ii. Parking areas and driveways shall be clearly identified and separated from principal pedestrian routes and recreation areas by curbs, pavement markings, planting areas, fences, or similar features designed to promote pedestrian and bicycle safety. One or more bike racks shall be provided for the convenience of employees, customers, and tenants.

iii. Vehicular access to adjoining minor residential streets shall not be permitted when adequate access is available to collector streets or major thoroughfares and when adequate access for emergency vehicles can otherwise be provided.

(e) Storage and disposal of trash. Adequate provision shall be made for the storage of trash or waste material by the provision of trash compactors. Such compactors shall be approved by and meet those specifications established by the City Engineer with respect to capacity, design, and compatibility with municipal trash collection equipment. Trash storage equipment and materials stored outside a building shall be enclosed within permanent screening which shall keep trash and waste materials out of view and be accessible only to authorized personnel.

(f) Lighting. Premises open to the public between 6 p.m. and 7 a.m. shall be provided with artificial lighting. Such lighting shall be so arranged as to reflect the light away from any adjoining residential property with an average maintained footcandle (AMF) lighting level of 1.0. A lighting plan showing pertinent information shall be part of the Plan of Development submission. In determining if the above criteria are met, the Planning and Zoning Official shall consult with appropriate City agencies and may seek such additional technical advice as he/she deems necessary. The Planning and Zoning Official may recommend conditions of approval of any Plan of Development where such conditions are clearly necessary to insure conformance with the intent and purpose of the regulations set forth in this Article or elsewhere in this Chapter.

(g) Environmental protection.

1. *The project and related improvements shall be designed to protect land and water resources from pollution, including pollution of soils, groundwater, rivers, streams, lakes, ponds, and wetlands.*
2. *Stormwater retention, transport, and drainage facilities shall be designed to use or enhance the natural stormwater system on-site, including the storage and filtering capacity of wetlands, watercourses, and water bodies, and/or the infiltration capability of the natural landscape. Stormwater facilities shall not cause flooding or the potential for pollution of surface or groundwater, on-site or off-site.*
3. *General purpose floor drains shall be connected to a public sewer system or an on-site holding tank (not a septic system) in accordance with state, county and municipal requirements, unless a groundwater discharge permit has been obtained from the Michigan Department of Environmental Quality. General purpose floor drains which discharge to groundwater are generally prohibited.*
4. *Sites at which hazardous substances, hazardous wastes, or potentially polluting materials are stored, used, or generated shall be designed to prevent spills and discharges of such materials to the air, surface of the ground, groundwater, lakes, streams, rivers or wetlands.*
5. *Secondary containment facilities shall be provided for above ground storage of hazardous substances, hazardous wastes, or potentially polluting materials in accordance with state and federal requirements. Above ground secondary containment facilities shall be designed and constructed so that the potentially polluting material cannot escape from the unit by gravity through sewers, drains, or other means, directly or indirectly into a sewer system, or to the waters of the State (including groundwater).*
6. *Underground storage tanks shall be registered, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality.*
7. *Above ground storage tanks shall be certified, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality.*
8. *Bulk storage facilities for pesticides and fertilizers shall be in compliance with requirements of the Michigan Department of Agriculture.*
9. *Abandoned water wells (wells that are no longer in use or are in disrepair), abandoned monitoring wells, and cisterns shall be plugged in accordance with regulations and procedures of the Michigan Department of Environmental Quality.*
10. *State and federal requirements for storage, spill prevention, recordkeeping, emergency response, transport and disposal of hazardous substances, hazardous wastes, liquid industrial waste or potentially polluting materials shall be met. No discharge to surface water or groundwater, including direct and indirect discharges of waste, waste effluent, wastewater, pollutants, or cooling water, shall be allowed without approval from appropriate state, county and local agencies.*

(5) Review by Planning Commission. All recommendations by the Planning and Zoning Official to approve, reject, or modify a Plan of Development shall be reviewed by the Planning Commission at a public hearing to be scheduled by the Commission, provided that, the Planning and Zoning Official's decision and report are available prior to the meeting. Notice of the public hearing shall be made in accordance with procedures outlined in the Commission's Bylaws. The Commission may defer action to its next regular meeting in accordance with its Bylaws. The Commission shall recommend approval, rejection, or modification of the Plan by majority vote.

(6) Review by City Council. A report recommending approval, rejection, or modification by the Planning Commission shall be filed with the City Council within five (5) days. The City Council may approve, reject, modify, or stay action on the Plan within twenty (20) days of the filing; otherwise the recommendation of the Planning Commission shall become final upon expiration of the twenty (20) days.

(7) Granting of permits. After the approval of the Plan in accordance with the procedures in subsection (b), the Building Official shall approve the application for a building permit or certificate of occupancy, provided that, the Building Official is satisfied that the proposed construction and use of the premises conform with the applicable City Codes. The authority and responsibility of the Building Official shall, with respect to applications having been approved pursuant to this Chapter, be the same as for other applications for building permits and certificates of occupancy submitted for its approval, and nothing in this Article shall be constructed to abrogate such authority and responsibility.

(8) Procedures. Procedures for the processing and review of applications for building permits required by this Article shall be approved by the Planning Commission. Such procedures, in written form, shall be made available to applicants for building permits.

(9) Time limit of approval. If work on the proposed development has not begun within eighteen (18) months of the effective date of its approval, the approval shall automatically become null and void and all rights there under shall lapse; except that upon written application filed at least one (1) month prior to the termination of the eighteen (18) month limit, the Planning Commission may authorize a single extension of the time period of not more than twelve (12) months. Once work on the proposed development has begun, it shall be completed in accordance with the provisions and time limits of Section 5.147 of this Chapter; otherwise the approval shall automatically become null and void and all rights there under shall lapse, unless the time limit is extended by the Building Official or the Zoning Board of Appeals under the provisions of Section 5.147. For developments which include two (2) or more principal buildings or otherwise include improvements which are to be

constructed in phases, each phase shall be considered as a separate project for the purposes of Section 5.147.

d:\word\triground\elzon.doc

CITY OF LANSING

[Text in *italics* is proposed for addition. Text in ~~strikethrough~~ is proposed for deletion. Text in [BRACKETS] is a technical comment which would not be a part of the adopted amendment.]

1242.04. Site plans required.

(a) Except as described in Section 1242.07, a site plan shall be submitted to the Building Safety Office by the applicant for all of the following activities:

- (1) Construction of a permanent new structure;
- (2) Structural alteration of an existing structure when the effect of the alteration is to increase either the intensity of land use or the exterior physical dimension of ~~the any structure~~ *one-thousand square feet or greater in area*;
- (3) Excavation or filling of ground within the boundaries of the 100-year base floodplain of the City,
- (4) A special land use permit described in Chapter 1282 and conditional uses provided in Chapters 1248 through 1278;
- (5) A planned residential development described in Chapter 1280;
- (6) Construction of off-street parking. However, if the construction of off-street parking is constructed in conjunction with an activity described in paragraph (a)(1) or (2) hereof and is being processed pursuant to Section 1242.07, then only the requirements of Section 1242.07 shall be met.
- (7) A mobile home park;
- (8) An activity which relocates a structure from one lot to another lot or within the same lot; and
- (9) An activity for which a site plan is required by law.

(b) The Planning Division may waive the requirement of site plan review whenever the Planning Division and the applicant for the building permit are in agreement that there is no reasonable need for site plan review under the circumstances involved in the submitted building permit application.

(Ord. No. 636, 3-7-83)

1242.05. Contents of site plans.

(a) A site plan shall include all of the information described in this section.

(b) A site plan shall consist of a drawing which is drawn to scale, prepared in a professional manner, and contains all of the following information:

- (1) The name, address, *and* telephone number, *fax number and email address* of the applicant *and the architect, engineer, or other design professional*;
- (2) The legal description, or the permanent parcel number, and the address of the lot on which the activity is located;
- (3) The location of the proposed structure relative to the boundary lines of the lot described by the legal definition or the permanent parcel number in paragraph (b)(2) hereof;
- (4) If the total number of existing and proposed structures on the lot described by the legal description or the permanent parcel number in paragraph (b)(2) hereof includes not more than two separate structures, then the location of all existing and proposed structures relative to public and private streets, easements and alleys located within the lot described by the legal description or permanent parcel number in paragraph (b)(2) hereof; or if the lot described by the legal description or the permanent parcel number in paragraph (b)(2) hereof includes more than two existing or proposed structures, then the location of all existing and proposed structures relative to public and private streets, easements and alleys, which are located either within 200 feet of the proposed activity or the boundary line of the lot described by the legal description or the permanent parcel number in paragraph (b)(2) hereof, whichever is less;

Appendix IX

- (5) The location, number and layout of off-street parking spaces. The Planning Division may waive this requirement if, in the opinion of the Division, the minimum parking requirements of Chapter 1284 are met.
- (6) Points of ingress and egress to the lot if the lot is used as a one or two-family dwelling; and if the lot is not used as a one or two-family dwelling, each point of ingress or egress which is intended to serve the proposed activity. In addition, if the lot is not used as a one or two-family dwelling, the applicant shall show each point of ingress or egress within 120 feet of each point of each ingress or egress intended to serve the proposed activity.
- (7) Any loading zone created to serve the proposed activity;
- (8) Landscaping, screening and buffering *proposed and/or required by any provision in the Zoning Code*, required by Chapter 1290 or resolution of Council;
- (9) Existing and proposed land elevations *and/or contours to appropriately illustrate topography. Indicate direction of drainage flow, which are required by law;* and

(Ord. No. 636, 3-7-83)

- (10) *The location and elevations of existing water courses and water bodies, including county drains and manmade surface drainageways, floodplains, and wetlands.*
- (11) *Proposed stormwater management plan including design of sewers, outlets, and retention or detention ponds. Sufficient data regarding site runoff estimates and off-site drainage patterns shall be provided to permit review of feasibility and permanence of drainage detention and/or retention as well as the impact on local surface and groundwater.*
- (12) *The location and status of any floor drains in existing or proposed structures on the site. The point of discharge for all drains and pipes shall be specified on the site plan.*
- (13) *Location of any on-site wastewater treatment and disposal systems.*
- (14) *Location of existing and proposed public water mains, public and private drinking water wells, monitoring wells, irrigation wells, test wells or wells used for industrial processes.*
- (15) *Inventory of hazardous substances to be stored, used or generated on-site, presented in a format acceptable to the City Fire Marshal (include CAS numbers). [CAS NUMBER = CHEMICAL ABSTRACT SERVICE NUMBER. THIS IS A UNIQUE NUMBER FOR EVERY CHEMICAL ESTABLISHED BY A COLUMBUS OHIO ORGANIZATION WHICH INDEXES INFORMATION PUBLISHED IN "CHEMICAL ABSTRACTS" BY THE AMERICAN CHEMICAL SOCIETY. IT IS USED (AMONG OTHER PURPOSES) IN MAINTAINING CHEMICAL INVENTORIES USED BY DEQ FOR REGULATORY PURPOSES, BY FIREFIGHTERS FOR FIREFIGHTER RIGHT TO KNOW PURPOSES AND BY PUBLIC SERVICE DEPARTMENTS RESPONSIBLE FOR DISCHARGES INTO STORMWATER OR MUNICIPAL SEWER SYSTEMS. IT IS ONLY REFERRED TO BY THE ACRONYM CAS AND IS NEVER SPELLED OUT. IT COULD BE DEFINED IN THE DEFINITIONS SECTION OF THE ORDINANCE IF DESIRED.]*
- (16) *Descriptions of type of operations proposed for the project and drawings showing size, location, and description of any proposed interior or exterior areas of structures for storing, using, loading or unloading of hazardous substances, hazardous wastes, and/or polluting materials.*
- (17) *Description and location for any existing or proposed above ground and below ground storage facilities.*
- (18) *Delineation of areas on the site which are known or suspected to be contaminated, together with a report on the status of cleanup or closure.*
- (19) *Completion of the Environmental Permits Checklist on the form provided by the Zoning Administrator.*
- (20) *Signs, including locations, sizes and heights.*
- (21) *Exterior lighting showing the area of illumination and indicating the type of fixture to be used.*
- (22) *Information which is required by law.*

1242.06. Review and approval of the site plans.

(a) After a building permit is requested for any of the activities described in Section 1242.04, the Building Safety Office shall refer the building permit application and the site plan to the Planning Division. The applicant may file an additional site plan with the Division at the same time the application for a building permit is submitted.

(b) Upon receipt by the Planning Division of a site plan which meets the requirements of Section 1242.05, the Division shall review the site plan for the purpose of determining if an activity described in Section 1242.04 meets the use and dimensional requirements of this Zoning Code *and the requirements of Section 1242.08*.

(c) Not more than ~~two~~ *five* working days after the receipt of a site plan which meets the requirements of Section 1242.05, for a use permitted in the A, A-1, B or C Residential District, the Planning Division shall either approve or disapprove the site plan.

(d) Not more than ~~seven~~ *ten* working days after the receipt of a site plan which meets the requirements of Section 1242.05 for any district except A, A-1, B and C Residential Districts, the Planning Division shall either approve or disapprove the site plan.

(e) The Planning Division shall approve a site plan only if it contains the information required in Section 1242.05 and if the activity described in the site plan meets all the use and dimensional requirements of this Zoning Code *and the requirements of Section 1242.08*.

Appendix IX

(f) If a site plan review is required, a building permit shall not be issued by the Building Safety Office, unless the Planning Division approves the site plan pursuant to this section. (Ord. No. 636, 3-7-83)

1242.07. Modified site plans.

(a) A site plan, as described in Sections 1242.04 and 1242.05, shall not be required for an activity described in Section 1242.04(a)(1) or (2), if either condition described in subsection (b) hereof is met. Instead, a modified site plan shall be required in accordance with subsection (c) hereof

(b) A modified site plan which meets the requirements of subsection (c) hereof shall be submitted if either of the following conditions is met:

- (1) The activity described in Section 1242.04(a)(1) or (2) is on a lot which does not abut a railroad right of way and the activity is more than fifty feet from the applicant's lot line.
- (2) The activity described in Section 1242.04(a)(1) or (2) is on a lot which is abutting a railroad right of way and the activity is more than fifty feet from the applicants lot line on that part of the lot which does not abut a railroad right of way.

(c) If either condition described in (b) hereof is met, then a modified site plan may be submitted. It shall contain only the following information:

The location and height of the structure;

If the construction work involved in then activity described in Section 1242.04(a)(1) and (2) results in eliminating existing parking spaces during construction, then to the extent that the elimination of such spaces results in the applicant not meeting the off-street parking requirements of Chapter 1284, provisions for reasonable interim replacement off-street parking spaces which meet the number of spaces required by Chapter 1284;

An estimate of the number of required additional off-street parking spaces necessitated by the activity described in Section 1242-04(a)(1) or (2) and the intended location of required or additional replacement off-street parking. If no additional or replacement off-street parking is required, then the information required by paragraphs (c)(1) and (2) hereof is sufficient.

If additional or replacement off-street parking is required, a statement provided by the applicant which indicates approximately when the activity described in Section 1242.04(a)(1) or (2) shall be fifty percent completed.

If additional or replacement off-street parking is required, when the activity is fifty percent completed, the applicant shall submit to the Planning Division a detailed parking plan which contains the following information:

The location, number and layout of all required additional or replacement off-street parking facilities; and

The points of ingress and egress which will serve the required additional or replacement off-street parking facilities.

(d) Upon receipt by the Planning Division of a modified site plan which meets the requirements of this section, the Division shall review the modified site plan for the purpose of determining if the activity proposed by the applicant meets the use and dimensional requirements of this Zoning Code and will meet the parking requirements of Chapter 1284 upon completion of the proposed activity. Not more than five working days after its receipt, the Division shall either approve or disapprove the modified site plan. The Division shall approve the modified site plan if it meets the use and dimensional requirements of this Zoning Code and will meet the parking requirements of Chapter 1284 when the activity is completed.

(e) A building permit shall not be issued by the Building Safety Office unless the Planning Division approves a modified site plan as described in this section.

(Ord. No. 636, 3-7-83)

[FOLLOWING IS A NEW SECTION THAT IS NEEDED TO CONFORM WITH EXISTING STATUTORY REQUIREMENTS AND TO IMPLEMENT THE NEW STANDARDS TO ENSURE PROTECTION OF GROUNDWATER RESOURCES.]

1242.08 Site Plan Approval Standards

Prior to approving a site plan, the Planning Division, shall require that the following standards be satisfied. If these standards and the other requirements noted in this Section or other ordinances are met, the site plan shall be approved.

a. *For uses having frontage and/or access on a regional arterial, the number, design and location of access driveways and other provisions for vehicular circulation shall comply with the provisions of Chapter 1284.18, Ingress and Egress.*

b. *Landscaping, landscape buffers and greenbelts shall be provided and designed in accordance with the provisions of Chapter 1290, Landscape Standards.*

c. *All elements of the site plan shall be designed to take into account the site's topography, the size and type of plot, the character of adjoining property and the type and size of buildings. The site shall be developed so as not to impede the normal and orderly development or improvement of surrounding property for uses permitted in this Ordinance.*

d. The landscape shall be preserved in its natural state, insofar as practical, by removing only those areas of vegetation or making those alterations to the topography which are reasonably necessary to develop the site in accordance with the requirements of this Ordinance.

e. The site plan shall provide reasonable visual and sound privacy for all dwelling units located therein. Fences, walks, barriers and landscaping shall be used, as appropriate, to accomplish these purposes.

f. All buildings or groups of buildings shall be arranged so as to permit necessary emergency vehicle access as required by the Fire Department.

g. A pedestrian circulation system which is separated from the vehicular circulation system may be required. In order to ensure public safety, special pedestrian measures, such as sidewalks, crosswalks, crossing signals and other such facilities may be required in the vicinity of schools, playgrounds, shopping areas and other uses which generate a considerable amount of pedestrian traffic.

h. The arrangement of public or common ways for vehicle and pedestrian circulation shall be connected to existing or planned streets and pedestrian or bicycle pathways in the area. Streets and drives which are part of an existing or planned street pattern serving adjacent development shall be of a width appropriate to the traffic volume they will carry and shall have a dedicated right-of-way equal to that specified in the City's Comprehensive Plan and Subdivision Regulations.

x. All streets shall be developed in accordance with the Subdivision Regulations, unless developed as a private road in accordance with the requirements of Chapter 1236, Design_Standards.

y. Appropriate measures shall be taken to ensure that removal of surface waters will not adversely affect neighboring properties or the public storm drainage system. Provisions shall be made to accommodate storm water, prevent erosion and the formation of dust. The use of detention/retention ponds may be required. Surface water on all paved areas shall be collected at intervals so that it will not obstruct the flow of vehicular or pedestrian traffic or create puddles in paved areas. All on-site storm drainage facilities shall be developed in accordance with the specifications of the Ingham County Drain Commissioner's Office and/or the City Engineer, as applicable.

z. Exterior lighting shall be arranged so that it is deflected away from adjacent properties and so that it does not impede the vision of traffic along adjacent streets. Flashing or intermittent lights shall not be permitted.

aa. Properties abutting streets which have right of way deficiencies, as identified in the Comprehensive Plan, shall provide additional right of way to the appropriate agency as determined by the Planning Division. The additional right of way shall be provided to the appropriate agency via written documentation prior to final site plan approval by the Planning Division.

bb. Safe, suitable, and adequate access shall be provided. The following factors shall be considered when determining whether safe and adequate access exists:

- (a) Generally developments generating more than 500 trips per day shall be required to provide a second access point. Trip generation estimates shall be based upon equations/rates provided in the most recent edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.
- (b) Topography and natural features surrounding the subject parcel shall be considered.
- (c) The provision of outlots, stub streets, etc. which may facilitate future access.
- (d) The likelihood of adjacent properties being developed in the near future such that they could be connected to the subject parcel.
- (e) Proximity to emergency services.
- (f) The adequacy of the proposed street intersection in terms of sight distances, spacing, slope, etc.

cc. The project and related improvements shall be designed to protect land and water resources from pollution, including pollution of soils, groundwater, rivers, streams, lakes, ponds, and wetlands.

dd. Stormwater detention, retention, transport, and drainage facilities shall, insofar as feasible, be designed to use or enhance the natural stormwater system on-site, including the storage and filtering capacity of wetlands, watercourses, and water bodies, and/or the infiltration capability of the natural landscape. Stormwater facilities shall be designed so as not to cause flooding or the potential for pollution of surface or groundwater, on-site or off-site.

ee. General purpose floor drains shall be connected to a public sewer system or an on-site holding tank (not a septic system) in accordance with state, county and municipal requirements, unless a groundwater discharge permit has been obtained from the Michigan Department of Environmental Quality. General purpose floor drains which discharge to groundwater are generally prohibited.

ff. Sites at which hazardous substances, hazardous wastes, or potentially polluting materials are stored, used, or generated shall be designed to prevent spills and discharges of such materials to the air, surface of the ground, groundwater, lakes, streams, rivers or wetlands.

gg. Secondary containment facilities shall be provided for above ground storage of hazardous substances, hazardous wastes, or potentially polluting materials in accordance with state and federal requirements. Above ground secondary containment facilities shall be designed and constructed so that the potentially polluting material cannot escape from the unit by gravity through sewers, drains, or other means, directly or indirectly into a sewer system, or to the waters of the State (including groundwater).

hh. Underground storage tanks shall be registered, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality.

ii. Above ground storage tanks shall be certified, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality.

jj. Bulk storage facilities for pesticides and fertilizers shall be in compliance with requirements of the Michigan Department of Agriculture.

kk. Abandoned water wells (wells that are no longer in use or are in disrepair), abandoned monitoring wells, and cisterns shall be plugged in accordance with regulations and procedures of the Michigan Department of Environmental Quality and the Ingham County Health Department.

ll. State and federal requirements for storage, spill prevention, recordkeeping, emergency response, transport and disposal of hazardous substances, hazardous wastes, liquid industrial waste or potentially polluting materials shall be met. No discharge to surface water or groundwater, including direct and indirect discharges of waste, waste effluent, wastewater, pollutants, or cooling water, shall be allowed without approval from appropriate state, county and local agencies.

D:\word\triground\Lanci3.doc
July 30, 2000

LANSING TOWNSHIP

[Text in *italics* and underlined is proposed for addition. Text in ~~strikethrough~~ is proposed for deletion. Text in [BRACKETS] is a comment for discussion.]

Section 85- 1 0.1 Site Plan Review Procedures

1. Applicant. The owner, or his designated agent, of the subject property shall file a request with the township clerk for site plan approval.
2. Application. Applications for site plan approval shall be submitted to the township planning commission on a special form for that purpose. Each application for approval shall be accompanied by the payment of a fee in accordance with the township's duly adopted "schedule of fees" to cover costs of processing the application. No part of the fee shall be refundable.
3. Date required in the site plan application. Every application for site plan approval shall be accompanied by the following information and data:
 - a. A special form supplied by the township clerk and filled out in full by the applicant. This form shall contain the following information:
 1. The applicant's name and address in full.
 2. Applicant's phone number.
 3. Date of filing.
 4. A statement that the applicant is the owner of the property, accompanied by proof of ownership, or acting on the owner's behalf, with power of attorney.
 5. The name, address and phone number of the owner of record if applicant is not the owner of record.
 6. The address, subdivision and lot number and/or parcel number of the property and a legal description.
 7. The proposed use of the property.
 8. The current zoning of the property.
 9. Indication of whether the property is in a State approved Wellhead Protection Area.
 - b. A site plan, drawn to scale of one inch equals 200 feet or less, of the entire property involved showing:
 1. Dimensions of property.
 2. Existing topographic elevations at two foot changes in height.
 3. Location of abutting streets and proposed alignment of streets, drives, sidewalks, and all easements serving the development.
 4. Existing public right-of-way, pavements, and/or public or private easements.

Appendix IX

5. Existing buildings and structures.
 6. Location of parking areas including required number of parking spaces in each area, and including handicap designated spaces and surface material.
 7. Zoning classification of abutting properties.
 8. All known existing aerial and underground facilities.
 9. Proposed utilities and services and tentative locations, including dumpsters. Location for on-site wastewater treatment and disposal systems. [LIST RENUMBERED FROM HERE TO END.]
 10. Location of existing and proposed public water mains, public and private drinking water wells, monitoring wells, irrigation wells, test wells or wells used for industrial processes.
Proposed grades and site drainage pattern.
 11. ~~Watercourses and water bodies, including manmade surface drainageways.~~ The location and elevations of existing water courses and water bodies, including county drains and manmade surface drainageways, floodplains, and wetlands.
 12. Proposed stormwater management plan including design of sewers, outlets, and retention or detention ponds. Sufficient data regarding site runoff estimates and off-site drainage patterns shall be provided to permit review of feasibility and permanence of drainage detention and/or retention as well as the impact on local surface and groundwater.
 13. Significant existing vegetation (trees, shrubs and other plantings).
 14. Directional arrow indicating "North".
 15. Proposed common open space facilities, if applicable.
 16. Proposed accessory buildings and uses including free-standing signs.
 17. Location of proposed buildings and intended uses thereof.
 18. Sidewalks in accordance with Chapter 21 of the Code of Ordinances.
 19. Location of property with respect to Wellhead Protection Area, if applicable.
 20. The location and status of any floor drains in existing or proposed structures on the site. The point of discharge for all drains and pipes shall be specified on the site plan.
 21. Inventory of hazardous substances to be stored, used or generated on-site, presented in a format acceptable to the Township Fire Marshal (include CAS numbers). [CAS NUMBER = CHEMICAL ABSTRACT SERVICE NUMBER. THIS IS A UNIQUE NUMBER FOR EVERY CHEMICAL ESTABLISHED BY A COLUMBUS OHIO ORGANIZATION WHICH INDEXES INFORMATION PUBLISHED IN "CHEMICAL ABSTRACTS" BY THE AMERICAN CHEMICAL SOCIETY. IT IS USED (AMONG OTHER PURPOSES) IN MAINTAINING CHEMICAL INVENTORIES USED BY DEQ FOR REGULATORY PURPOSES, BY FIREFIGHTERS FOR FIREFIGHTER RIGHT TO KNOW PURPOSES AND BY PUBLIC SERVICE DEPARTMENTS RESPONSIBLE FOR DISCHARGES INTO STORMWATER OR MUNICIPAL SEWER SYSTEMS. IT IS ONLY REFERRED TO BY THE ACRONYM CAS AND IS NEVER SPELLED OUT. IT COULD BE DEFINED IN THE DEFINITIONS SECTION OF THE ORDINANCE IF DESIRED.]
 22. Descriptions of type of operations proposed for the project and drawings showing size, location, and description of any proposed interior or exterior areas of structures for storing, using, loading or unloading of hazardous substances, hazardous wastes, and/or polluting materials.
 23. Description and location for any existing or proposed above ground and below ground storage facilities.
 24. Delineation of areas on the site which are known or suspected to be contaminated, together with a report on the status of cleanup or closure.
 25. Completion of the Environmental Permits Checklist on the form provided by the Zoning Administrator.
- c. A landscape plan to scale identifying plant materials and location of plantings.
 - d. The site plan information sheet fully completed by the applicant or agent.
 - e. The planning commission may require the petitioner to supply any additional data from the proper professional sources as it deems necessary.

Section 85-10.3

(1) Site Plan Approval

- a. Once site plans have been recommended for approval by the planning commission and approved by the township board, any material changes such as changes in location of building or size of building, ingress or egress or parking circulation, number of parking spaces provided or grading and drainage patterns, etc. shall require a resubmission to the planning commission and payment of the fee unless the fee is specifically waived by resolution of the board of trustees.
- b. The board of trustees, at its next regular meeting after the planning commission's recommendation, shall consider the site plan. Reasons for rejection shall be set forth in the minutes of the board. If accepted, the township clerk shall issue a certificate of site plan approval.
- c. If no construction has begun within 365 days of the issuance of the certificate of site plan approval, the site plan shall become null and void.

Section 85-10.4 Standards for Site Plan Approval.

- (1) For "C" zoning, a floor plan shall be provided showing each floor of each building.
- (2) All elements of the site plan shall be harmoniously and efficiently organized in relation to topography, the size and type of lot, the character of adjoining property and the type and size of buildings. The

- site will be so developed as to not impede the normal and orderly development or improvement of surrounding property for uses permitted in the ordinance.
- (3) The landscape shall be preserved in its natural state, insofar as practicable, by minimizing tree and soil removal, and by topographic modifications which result in maximum harmony with adjacent areas.
 - (4) The site plan shall provide reasonable, visual and sound privacy for all dwelling units located therein. Fences, walks, barriers and landscaping shall be used as appropriate for the protection and enhancement of the property and the privacy of its occupants.
 - (5) All buildings or groups of buildings shall be so arranged as to permit emergency vehicle access by some practical means to all sides.
 - (6) Every structure or dwelling unit shall leave access to a public street walkway or other area dedicated to common use.
 - (7) There shall be provided a pedestrian circulation system which is insulated as completely as reasonably possible for the vehicular circulation system. In order to ensure public safety, pedestrian underpasses or overpasses may be required in the vicinity of schools, playgrounds, local shopping areas and other uses which may generate a considerable amount of pedestrian traffic.
 - (8) The arrangement of public or common ways for vehicular and pedestrian circulation shall respect the pattern of existing or planned streets and pedestrian or bicycle pathways in the area. Streets and drives which are part of an existing or planned street pattern which serves adjacent development shall be of a width appropriate to the traffic volume they will carry and shall have a dedicated right-of-way equal to that specified by the Ingham County Road Commission.
 - (9) All streets shall be developed in accordance with the township Subdivision Control Ordinance and the Ingham County Road Commission specifications, unless otherwise approved by the Board of Trustees.
 - (10) Appropriate measures shall be taken to ensure that removal of surface waters will not adversely affect neighboring properties or the public storm drainage system. Provisions shall be made for the construction of sewer facilities including grading, gutters, piping and the treatment of turf to handle stormwater, prevent erosion and the formation of dust. Surface water on all paved areas shall be collected at intervals so that it will not obstruct the flow of vehicular or pedestrian traffic and will not create puddles in paved areas.
 - (11) Outside storage areas, including dumpsters, shall be protected by opaque screening not less than six feet in height.
 - (12) Exterior lighting shall be so arranged that it is deflected away from adjacent properties and so that it does not impede the vision of traffic along adjacent streets. Flashing or intermittent lights shall not be permitted.
 - (13) Buffer strip shall be required when commercial property faces residential property. Such strip shall be a minimum of 20 feet wide and shall not be part of the normal roadway right-of-way or utility easement. Such buffer may be a berm or plantings in the form of shrubs, trees or bushes with a minimum of four feet in height. Such buffer shall be properly maintained.
 - (14) In approving the site plan, the planning commission may recommend to the township board that a bond or other financial guarantee acceptable to the township of ample sum be furnished by the developer to ensure compliance for such requirements as drives, walks, utilities, parking, landscaping, and the like. Whenever a bond is recommended, the planning commission shall forward a copy of the site plan to the board for approval.
 - (15) Driveways serving more than one lot may be considered a private road but shall be built to Road Commission standards, including provision of appropriate right of way for possible future dedication.
 - (16) The project and related improvements shall be designed to protect land and water resources from pollution, including pollution of soils, groundwater, rivers, streams, lakes, ponds, and wetlands.
 - (17) Stormwater detention, retention, transport, and drainage facilities shall insofar as is feasible, be designed to use or enhance the natural stormwater system on-site, including the storage and filtering capacity of wetlands, watercourses, and water bodies, and/or the infiltration capability of the natural landscape. Stormwater facilities shall be designed so as not to cause flooding or the potential for pollution of surface or groundwater, on-site or off-site. Stormwater facilities shall conform with the requirements of the Ingham County Drain Commissioner.
 - (18) General purpose floor drains shall be connected to a public sewer system or an on-site holding tank (not a septic system) in accordance with state, county and municipal requirements, unless a groundwater discharge permit has been obtained from the Michigan Department of Environmental Quality. General purpose floor drains which discharge to groundwater are generally prohibited.
 - (19) Sites at which hazardous substances, hazardous wastes, or potentially polluting materials are stored, used, or generated shall be designed to prevent spills and discharges of such materials to the air, surface of the ground, groundwater, lakes, streams, rivers or wetlands.
 - (20) Secondary containment facilities shall be provided for above ground storage of hazardous substances, hazardous wastes, or potentially polluting materials in accordance with state and federal requirements. Above ground secondary containment facilities shall be designed and constructed so that the potentially polluting material cannot escape from the unit by gravity through sewers, drains, or other means, directly or indirectly into a sewer system, or to the waters of the State (including groundwater).

- (21) Underground storage tanks shall be registered, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality.
- (22) Above ground storage tanks shall be certified, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality.
- (23) Bulk storage facilities for pesticides and fertilizers shall be in compliance with requirements of the Michigan Department of Agriculture.
- (24) Abandoned water wells (wells that are no longer in use or are in disrepair), abandoned monitoring wells, and cisterns shall be plugged in accordance with regulations and procedures of the Michigan Department of Environmental Quality and the Ingham County Health Department.
- (25) State and federal requirements for storage, spill prevention, recordkeeping, emergency response, transport and disposal of hazardous substances, hazardous wastes, liquid industrial waste or potentially polluting materials shall be met. No discharge to surface water or groundwater, including direct and indirect discharges of waste, waste effluent, wastewater, pollutants, or cooling water, shall be allowed without approval from appropriate state, county and local agencies.

D:\word\triground\lantwpsp2.doc
July 12, 2000

MERIDIAN CHARTER TOWNSHIP

[Text in *italics* is proposed for addition. Text in ~~strikethrough~~ is proposed for deletion. Text in [BRACKETS] is a note for discussion.]

CHAPTER 83

SITE PLAN REVIEW

Section 83-1 PURPOSE: The Board of Trustees and the Planning Commission of the Charter Township of Meridian find that commercial, institutional, office, industrial, utility, and other non-residential uses in Meridian Charter Township have a substantial impact upon the character of the community, and upon traffic, utilities and property values therein, thereby affecting the public health, safety, and general welfare thereof. Therefore, in order to foster the attractiveness of the community and to enhance and preserve its desirability as a place to live and to work, and thereby preserve property values, and in order to provide an efficient road and utility network, insure the movement of traffic, implement comprehensive planning and better serve the public health, safety and general welfare, it is hereby determined that plans for such uses shall be referred to the Planning Commission of the Charter Township of Meridian in accordance with this Title.

Section 83-2 APPLICATION: No building in Meridian Charter Township shall be erected or moved, or externally altered or added to or enlarged, and no building or land therein shall be used, and no building permit or occupancy permit shall be issued, except in accordance with site and building plans that have been approved as provided by this Title; provided, however, that this Chapter 83 shall not apply to multiple residential or single family, detached residential structures or uses of non-commercial structures accessory thereto.

Section 83-3 REVIEWING AUTHORITY: The Planning Department shall assist the Planning Commission by reviewing all applications for site plan review in accordance with the standards presented in this Article and this Title. The Planning Department is empowered to approve or deny requests for site plan approval, however, an applicant who is denied approval by the Planning Department may appeal that decision to the Planning Commission. The Planning Director shall provide the Planning Commission with a monthly report of his decisions concerning site plan review.

Section 83-4 PROCEDURE: The following procedures shall govern the submission and review of site and building plans.

83-4.1 Submission: The developer shall submit to the Planning Director site plans which may be preliminary or final plans. Such submission shall include:

- a. A site plan drawn to a readable scale showing the dimensions of the property to be used; the size, shape, and location of existing and proposed buildings and structures; the location layout of parking areas, all parking spaces and driveways; proposed grades and drainage, proposed sewer and water facilities and connections; a landscape plan including locations, sizes, and names of proposed plantings and screenings; proposed locations and types of fencing, signs and advertising features.
- b. Such other information as is necessary to enable the Planning Director and the Planning Commission to determine whether the proposed site plan will conform to the provisions of this Title.

[NOTE: THIS IS AN EXTREMELY LIMITED SET OF SITE PLAN REVIEW SUBMITTAL REQUIREMENTS. FOLLOWING ARE THE LIST OF SUBMITTAL REQUIREMENTS NECESSARY TO ENSURE GROUNDWATER PROTECTION. THESE ARE NORMALLY IN ADDITION TO A MUCH LONGER LIST THAN PROVIDED ABOVE. PLEASE ADVISE IF YOU WANT EXAMPLES OF MORE TYPICAL SITE PLAN REVIEW SUBMITTAL REQUIREMENTS.]

- (c) *Existing topographic elevations at two (2) foot contour intervals. Indicate direction of drainage flow.*
- (d) *The location and elevations of existing water courses and water bodies, including county drains and manmade surface drainageways, floodplains, and wetlands.*
- (e) *Proposed stormwater management plan including design of sewers, outlets, and retention or detention ponds. Sufficient data regarding site runoff estimates and off-site drainage patterns shall be provided to permit review of feasibility and permanence of drainage detention and/or retention as well as the impact on local surface and groundwater.*
- (f) *The location and status of any floor drains in existing or proposed structures on the site. The point of discharge for all drains and pipes shall be specified on the site plan.*
- (g) *Location for on-site wastewater treatment and disposal systems.*
- (h) *Location of existing and proposed public and private drinking water wells, monitoring wells, irrigation wells, test wells or wells used for industrial processes.*
- (i) *Inventory of hazardous substances to be stored, used or generated on-site, presented in a format acceptable to the local fire marshal (include CAS numbers).*
- (j) *Descriptions of type of operations proposed for the project and drawings showing size, location, and description of any proposed interior or exterior areas of structures for storing, using, loading or unloading of hazardous substances, hazardous wastes, and/or polluting materials.*
- (k) *Description and location for any existing or proposed above ground and below ground storage facilities.*
- (l) *Delineation of areas on the site which are known or suspected to be contaminated, together with a report on the status of cleanup or closure.*
- (m) *Completion of the Environmental Permits Checklist on the form provided by the Zoning Administrator.*

VIII-81

83-4.2 Actions: The Planning Department shall within fourteen working days of the receipt of any submission by a developer act to either approve or deny the request for site plan approval. If denied the Planning Director shall submit to the applicant in writing the reasons for the action.

83-4.3 Appeals: If any person shall be aggrieved by the action of the Planning Department, appeal in writing may be taken to the Planning Commission within ten days after the date of such action. After review of the request the Planning Commission shall affirm or reverse the action of the Planning Department, stating its reasons in writing to the appellant within twenty-one (21) days. Any appeal shall be advertised and the public notified once prior to hearing before the Planning Commission.

83-4.4 Appeal of the Planning Commission: If any person shall be aggrieved by the action of the Planning Commission, appeal in writing to the Township Board of Trustees may be taken within ten days after the date of such action. The Township Board of Trustees shall fix and notify the appellant of a time and place for a public hearing to be published in a newspaper circulating in the township no more than eight days prior to the hearing. All parties in interest shall be afforded an opportunity to be heard thereat. After such hearing, the Township Board of Trustees shall affirm or reverse the action of the Planning Commission, stating its findings and the reasons for its action, and a written copy of such findings, reasons, and action shall be given to the appellant.

83-5 Site Plan Review Standards: The following standards shall be utilized by the Planning Department in reviewing all site plans. These standards are intended to provide a frame of reference for the applicant in the development of site plans as well as a method of review for the reviewing authority. These standards shall not be regarded as inflexible requirements. They are not intended to discourage creativity, invention and innovation.

83-5.1 Preservation of Landscape: The landscape shall be preserved in its natural state, insofar as practicable, by minimizing tree and soil removal, and any grade changes shall be in keeping with the general appearance of neighboring developed areas.

83-5.2 Relations of Proposed Buildings to Environment: Proposed structures shall be related harmoniously to the terrain and to existing buildings in the vicinity that have a visual relationship to the proposed buildings. The achievement of such relationship may include the enclosure of space in conjunction with other existing buildings or other proposed buildings and their creation of focal points with respect to avenues of approach, terrain features or other buildings.

83-5.3 Drives, Parking and Circulation: With respect to vehicular and pedestrian circulation, including walkways, interior drives and parking, special attention shall be given to location and number of access points to the public streets, width of interior drives and access points, general interior circulation, separation of pedestrian and vehicular traffic, and arrangement

of parking areas that are safe and convenient and, insofar as practicable, do not detract from the design of proposed buildings and structures and the neighboring properties.

83-5.4 Surface Water Drainage: Special attention shall be given to proper site surface drainage so that removal of surface waters will not adversely affect neighboring properties or the public storm drainage system. If practical, storm water shall be removed from all roofs, canopies, and paved areas and carried away in an underground drainage system. Surface water in all paved areas shall be collected at intervals so that it will not obstruct the flow of vehicular or pedestrian traffic, and will not create puddles in the paved areas.

83-5.5 Utility Service: Electric and telephone distribution lines shall be underground. Any utility installations remaining above ground shall be located so as to have an harmonious relation to neighboring properties and the site. The proposed method of sanitary sewage disposal from all buildings shall be indicated. In any case, all utility installations shall be carried out in accordance with the Standard Rules and Regulations of current adoption of the Michigan Public Service Commission.

83-5.6 Advertising Features: The size, location and lighting of all permanent signs and outdoor advertising structures or features shall be consistent with the requirements of Chapt. 85 of this Title.

83-5.7 Special Features: Exposed storage areas, exposed machinery installations, service areas, truck loading areas, utility buildings, and structures, and similar accessory areas and structures shall be subject to such setbacks, screen plantings or other screening methods as shall reasonably be required to prevent their being incongruous with the existing or contemplated environment and the surrounding properties.

83-5.8 Additional Requirements: All other standards and requirements of this Title must be met by site plans presented for review under the provisions of this article.

83-5.9: The project and related improvements shall be designed to protect land and water resources from pollution, including pollution of soils, groundwater, rivers, streams, lakes, ponds, and wetlands.

83-5.10: Stormwater retention, transport, and drainage facilities shall be designed to use or enhance the natural stormwater system on-site, including the storage and filtering capacity of wetlands, watercourses, and water bodies, and/or the infiltration capability of the natural landscape. Stormwater facilities shall not cause flooding or the potential for pollution of surface or groundwater, on-site or off-site.

83-5.11: General purpose floor drains shall be connected to a public sewer system or an on-site holding tank (not a septic system) in accordance with state, county and municipal requirements, unless a groundwater discharge permit has been obtained from the Michigan Department of Environmental Quality. General purpose floor drains which discharge to groundwater are generally prohibited.

83.5.12: Sites at which hazardous substances, hazardous wastes, or potentially polluting materials are stored, used, or generated shall be designed to prevent spills and discharges of such materials to the air, surface of the ground, groundwater, lakes, streams, rivers or wetlands.

83.5.13: Secondary containment facilities shall be provided for above ground storage of hazardous substances, hazardous wastes, or potentially polluting materials in accordance with state and federal requirements. Above ground secondary containment facilities shall be designed and constructed so that the potentially polluting material cannot escape from the unit by gravity through sewers, drains, or other means, directly or indirectly into a sewer system, or to the waters of the State (including groundwater).

83.5.14: Underground storage tanks shall be registered, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality.

83.5.15: Above ground storage tanks shall be certified, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality.

83.5.16: Bulk storage facilities for pesticides and fertilizers shall be in compliance with requirements of the Michigan Department of Agriculture.

83.5.17: Abandoned water wells (wells that are no longer in use or are in disrepair), abandoned monitoring wells, and cisterns shall be plugged in accordance with regulations and procedures of the Michigan Department of Environmental Quality.

83.5.18: State and federal requirements for storage, spill prevention, recordkeeping, emergency response, transport and disposal of hazardous substances, hazardous wastes, liquid industrial waste or potentially polluting materials shall be met. No discharge to surface water or groundwater, including direct and indirect discharges of waste, waste effluent, wastewater, pollutants, or cooling water, shall be allowed without approval from appropriate state, county and local agencies.

MERIDIAN CHARTER TOWNSHIP
2nd option using Meridian's Proposed new SPR language as the base

[Text in *italics* is proposed for addition. Text in ~~strikethrough~~ is proposed for deletion. Text in [BRACKETS] is a note for discussion.]

81-3.3 Site Plan Review

- A. Purpose:** The Charter Township of Meridian finds that the development of non-residential and multiple family residential uses of land may have a substantial effect on the character of the community and its public health, safety, and general welfare. Therefore, this Section requires that all nonresidential and multiple family residential uses and structures be subject to site plan review in order to reasonably ensure that the development and use of land will not adversely affect the public health, safety and general welfare; to ensure compliance with this ordinance, other applicable ordinances, other Township planning documents, and state and federal statutes; and, to ensure that the proposed development is compatible with the surrounding uses.
- B. Applicability:** Except for single family or two family dwellings, a site plan approved under this Section is required for any of the following:
1. All building permits, grading permits, and certificates of occupancy.
 2. The construction, reconstruction, vertical or horizontal enlargement, relocation, or alteration of a building; or, conversion of use. An alteration is any change in the supporting members of an existing building, any change in the location of doors or windows, or any change in usable floor area; it does not include normal repairs or maintenance.
 3. Changes in on-site traffic flow or parking, or the removal of structural or vegetative screening.
- C. Preliminary Discussions; Conceptual Site Plan Review:** An applicant may meet with the Director of Community Planning and Development to discuss the requirements for a site plan review. In addition to the preliminary discussions, an applicant may submit a conceptual plan for review by the Director of Community Planning and Development in order that preliminary technical deficiencies may be addressed prior to submittal of an application for a site plan review. This procedure is intended to be informational only and shall not limit the substance of the review process.
- D. Application; Required Information:** The application shall be submitted to the Director of Community Planning and Development and shall include the following to encourage applicants to propose plans for and develop property which has high quality of site and building design. No application shall be processed until it is complete.
1. A site plan review application form available in the Department of Community Planning and Development containing the following information, where applicable:
 - a. The address and/or parcel number of the subject property.
 - b. The applicant's name, address, and phone number.
 - c. The name, address, and phone number of all persons with an ownership interest (if different from the applicant).
 - d. Name and address of the developer (if different from the applicant).
 - e. Name and address of the engineer, architect, landscape architect, land planner and/or land surveyor aiding in preparation of the site plan.

- f. Project title.
 - g. The gross and net acreage of all parcels in the project.
 - h. Projected time frame and development phases.
 - i. Total number of existing and proposed structures, units, bedrooms, or offices.
 - j. Square footage and usable floor area of existing and proposed buildings.
 - k. Number of existing and proposed parking spaces, carports, or garages.
 - l. Number of employees by shift.
 - m. Amount and type of existing and proposed recreation and open space.
2. A legal description and plot of survey of the subject property.
 3. Evidence of fee and/or other ownership of the subject property for which site plan review is being requested.
 4. A non-refundable fee in the amount established in the "Schedule of Fees" as adopted by the Township Board.
 5. Copies of required applications made to, and reviews or permits received from other Township, county, state, or federal departments and agencies.
 6. Layout plan, drawn to scale, showing the proposed location of structures and other improvements including roads, driveways, pedestrian walks, off-street parking areas, landscaped areas, buffers and screenings, vegetative pattern, natural features, fences and walls, lighting locations, and the land uses and zoning classifications on the subject parcel and adjoining parcels.
 7. Landscape plan, drawn to scale, showing the locations of existing trees proposed to be removed or retained on the site, the location and design of landscaped areas and the varieties and sizes of plant materials, including trees, shrubs, vines and ground covers, to be planted therein, and other landscape features as may be necessary to illustrate the landscape content.
 8. Utility plan, drawn to scale, showing the location and size of existing and proposed public water wells, mains and sanitary sewers and associated easement *or location for private drinking water wells, on-site wastewater treatment and disposal systems. Location of existing and proposed monitoring wells, irrigation wells, test wells or wells used for industrial processes shall also be depicted.* The location of private utilities including natural gas, electricity, telephone and cable television and associated easements shall also be shown on the plan.
 9. *The location and elevations of existing water courses and water bodies, including county drains and manmade surface drainageways, floodplains, and wetlands. Grading and drainage plans, drawn to scale, including design of storm sewers, outlets, and showing existing and proposed contours at 2-foot intervals, stormwater detention areas and retention ponds and the piped stormwater drainage system. Indicate direction of drainage flow. Sufficient data regarding site runoff estimates and off-site drainage patterns shall be provided to permit review of feasibility and permanence of drainage detention and/or retention as well as the impact on local surface and groundwater.*
 10. Floor plans and elevations, drawn to scale, illustrating all sides of the proposed structures as they will appear upon completion. All exterior surfacing materials and colors shall be specified.
 11. Sign plans, drawn to scale, indicating their size, materials, and illumination, if any.
 12. A map of the natural features of the site prior to development and a written description of the features to be retained, removed, or modified, and proposed measures to mitigate any negative impacts on the site and adjacent properties. Natural features to be addressed include, but are not limited to, wetlands, significant stands of trees or individual trees greater than 12 inches dbh, floodways, floodplains, waterbodies, identified ground water vulnerable areas, slopes greater than twenty (20%) percent, ravines, and wildlife, habitats vegetative cover types with potential to sustain significant or endangered wildlife.
 13. *The location and status of any floor drains in existing or proposed structures on the site. The point of discharge for all drains and pipes shall be specified on the site plan.*
 14. *Description and location for any existing or proposed above ground and below ground storage facilities.*
 15. *Delineation of areas on the site which are known or suspected to be contaminated, together with a report on the status of cleanup or closure.*

16. *Descriptions of type of operations proposed for the project and drawings showing size, location, and description of any proposed interior or exterior areas of structures for storing, using, loading or unloading of hazardous substances, hazardous wastes, and/or polluting materials.*
17. *Inventory of hazardous substances to be stored, used or generated on-site, presented in a format acceptable to the Township fire marshal (include CAS numbers). [CAS NUMBER = CHEMICAL ABSTRACT SERVICE NUMBER. THIS IS A UNIQUE NUMBER FOR EVERY CHEMICAL ESTABLISHED BY A COLUMBUS OHIO ORGANIZATION WHICH INDEXES INFORMATION PUBLISHED IN "CHEMICAL ABSTRACTS" BY THE AMERICAN CHEMICAL SOCIETY. IT IS USED (AMONG OTHER PURPOSES) IN MAINTAINING CHEMICAL INVENTORIES USED BY DEQ FOR REGULATORY PURPOSES, BY FIREFIGHTERS FOR FIREFIGHTER RIGHT TO KNOW PURPOSES AND BY PUBLIC SERVICE DEPARTMENTS RESPONSIBLE FOR DISCHARGES INTO STORMWATER OR MUNICIPAL SEWER SYSTEMS. IT IS ONLY REFERRED TO BY THE ACRONYM CAS AND IS NEVER SPELLED OUT. IT COULD BE DEFINED IN THE DEFINITIONS SECTION OF THE ORDINANCE IF DESIRED.]*
18. *Completion of the Environmental Permits Checklist on the form provided by the Zoning Administrator.*
19. Such other information as is necessary to enable the Director of Community Planning and Development to determine whether the proposed site plan will conform to the provisions of this Title.

F. **Review Process:** Upon a determination that the application is complete, the Director of Community Planning and Development shall initiate the following review process:

1. **Notice of Review:** Interested persons shall be notified of the site plan review as follows:
 - a. A notice of the review shall be sent by mail or personal delivery to the applicant and to the owners of property adjacent to the subject property at least fifteen (15) days prior to the date of the review. Such notice shall indicate the date, time, place, and subject of the review, and the place and time the proposed site plan may be examined.
 - b. The applicant shall post a notice of the review, on a form no smaller than six (6) square feet in area provided by the Township on the subject property at least fifteen (15) days prior to the review. Such notice shall indicate the date, time, place and purpose of the review.
2. **Review of Site Plan by the Director of Community Planning and Development:** The Director of Community Planning and Development shall review each site plan to determine whether it complies with this ordinance, other applicable ordinances and other Township Planning documents, any comments of other departments, and agencies, and state and federal statutes.
3. **Decision:** Upon receipt of all of the requested information, the Director of Community Planning and Development within thirty (30) days of the date the application is deemed complete, may approve, approve with conditions, or deny the application for site plan review as follows:
 - a. **Approval:** A site plan that complies with the ordinance and the conditions imposed pursuant to the ordinance, other Township planning documents, and state and federal statutes shall be approved.
 - b. **Conditional Approval:** A site plan that requires minor modifications for compliance may be conditionally approved. The Director of Community Planning and Development shall identify the required revisions, additional information, or conditions, and the applicant shall submit a revised site plan or additional information as requested to the Director of Community Planning and Development within thirty (30) days from the date of conditional approval. The Director shall verify that the site plan complies with the conditional approval prior to issuing any permits to commence construction or certifications for occupancy. In the event that the revised site plan or additional information is not submitted within thirty (30) days, the conditional approval shall be denied. The Director of Community Planning and Development Control may extend the thirty (30) day time period for good cause.
 - c. **Denial;** Upon determination that a site plan does not comply with the requirements and standards set forth in this ordinance, other applicable ordinances, other Township planning documents, or state and federal statutes, the site plan shall be denied. An applicant whose site plan has been denied may submit a new site plan, pay the applicable fee, and receive a new site plan review or appeal the denial.
4. **Notice of Decision:** The Director of Community Planning and Development shall notify the applicant in writing of the decision and the reasons therefore.
5. **Appeal:** An aggrieved Person may appeal the decision of the Director of Community Planning and Development in accordance with Section 81-3.4 B, "Appeals of Site Plan Decisions Made by the Director of Community Planning and Development."

G. **Review Criteria:** Site plans for projects shall be reviewed for compliance with the following standards and requirements, where applicable:

1. **Conformance to Zoning Regulations:** Each project shall satisfy all dimensional, landscaping, buffering, design and other requirements set forth in this ordinance and shall comply with other township, county, state and federal laws, ordinances and regulations.
2. **Review Standards:** The following review standards shall be applied in evaluating the site plan:
 - a. **Neighborhood & Community Character Standards:**
 1. **New or existing structures:** New or existing structures shall be constructed or renovated in a manner that is compatible with the surrounding neighborhood when adjacent to a residential zone.
 2. **Relation of Proposed Buildings to Environment:** Proposed buildings shall be adapted to the terrain, and the size and shape of the lot.
 - a. **Compatibility with surrounding buildings:** New buildings shall be compatible with the architectural character of surrounding buildings.
 - b. **Building materials:** Building materials shall be compatible with, or complimentary to, neighboring sites and structures.
 - c. **Siting:** The design of a building, its location on the site, and the site layout shall respond to specific site conditions, such as topography, solar and wind exposure, privacy, views, access, drainage and noise.
 - d. **Special Features:** Mechanical equipment, storage facilities, activity areas, utility buildings and structures, and similar accessory areas and structures shall be subject to such setbacks or screening methods as shall reasonably be required to prevent their being incongruous with or disruptive to adjacent properties.
 3. **Landscape Preservation:** The landscape should be preserved in as natural a state as possible by minimizing tree and soil removal. Sensitive areas, such as steep slopes, wetlands, and shore areas, as well as resource areas such as forests, wooded lots, and open space shall be preserved where practical.
 4. **Traffic:** New structures or uses shall not adversely impact traffic flows at or near their site to the extent that the public safety is endangered or the level of service is substantially deteriorated. Impacts on pedestrian and non-motorized travel will also be evaluated, particularly in areas where sidewalks are not present.
 5. **Lighting:** Exterior lighting shall be designed and illumination arranged so that it is directed downward and deflected away from adjacent properties; and so that it does not impair the vision of traffic along adjacent streets.
 6. **Advertising Features:** The size location and lighting of all permanent signs and outdoor advertising structures or features shall be consistent with the requirements of Chapter 85 of the Ordinance.
 - b. **Site Development Standards**
 1. **Fire and Emergency Access:** Setbacks, access paths, and fire hydrant locations shall be provided per existing statutes and ordinances and in accordance with the requirements of the appropriate reviewing authorities. All buildings or groups of buildings shall be so arranged as to permit emergency vehicle access as required by the Uniform Building Code or Uniform Fire Code as referenced in the Ordinance.
 2. **Parking and Loading:** The required number of parking and loading spaces for the intended use, as provided in the applicable zoning district regulations, shall be sufficient. Calculations and justifications for additional spaces shall be noted on the plans.
 3. **Drives and Circulation:** Attention shall be given to location and number of access points to the public streets, width of interior drives and access points, general interior circulations, separation of pedestrian and vehicular traffic, method of screening, and arrangement of parking areas that are safe, convenient, and do not detract from the design of proposed buildings and neighboring properties. The pedestrian circulation system shall be insulated where possible from the vehicular

circulation system. Shared parking and interior connecting drives shall be required wherever feasible.

4. **Surface Water Management:** Attention shall be given to proper site surface water management so that it will not adversely affect neighboring properties and natural features, or worsen downstream flooding and water quality.
 - a. *The project and related improvements shall be designed to protect land and water resources from pollution, including pollution of soils, groundwater, rivers, streams, lakes, ponds, and wetlands.*
 - b. *Stormwater detention, retention, transport, and drainage facilities shall, insomuch as feasible, be designed to use or enhance the natural stormwater system on-site, including the storage and filtering capacity of wetlands, watercourses, and water bodies, and/or the infiltration capability of the natural landscape. Stormwater facilities shall be designed so as not to cause flooding or the potential for pollution of surface or groundwater, on-site or off-site. Stormwater facilities shall conform with the requirements of the Ingham County Drain Commissioner and the Township Engineer.*
5. **Groundwater Protection:** Attention shall be given to all businesses and facilities, including private and public facilities, which use, store, or generate hazardous substances to ensure the following standards are met.
 - a. *General purpose floor drains shall be connected to a public sewer system or an on-site holding tank (not a septic system) in accordance with state, county and municipal requirements, unless a groundwater discharge permit has been obtained from the Michigan Department of Environmental Quality. General purpose floor drains which discharge to groundwater are generally prohibited.*
 - b. *Sites at which hazardous substances, hazardous wastes, or potentially polluting materials are stored, used, or generated shall be designed to prevent spills and discharges of such materials to the air, surface of the ground, groundwater, lakes, streams, rivers or wetlands.*
 - c. *Secondary containment facilities shall be provided for above ground storage of hazardous substances, hazardous wastes, or potentially polluting materials in accordance with state and federal requirements. Above ground secondary containment facilities shall be designed and constructed so that the potentially polluting material cannot escape from the unit by gravity through sewers, drains, or other means, directly or indirectly into a sewer system, or to the waters of the State (including groundwater).*
 - d. *Underground storage tanks shall be registered, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality.*
 - e. *Above ground storage tanks shall be certified, installed, operated, maintained, closed or removed in accordance with regulations of the Michigan Department of Environmental Quality.*
 - f. *Bulk storage facilities for pesticides and fertilizers shall be in compliance with requirements of the Michigan Department of Agriculture.*
 - g. *Abandoned water wells (wells that are no longer in use or are in disrepair), abandoned monitoring wells, and cisterns shall be plugged in accordance with regulations and procedures of the Michigan Department of Environmental Quality and the Ingham County Health Department.*
 - h. *State and federal requirements for storage, spill prevention, recordkeeping, emergency response, transport and disposal of hazardous substances, hazardous wastes, liquid industrial waste or potentially polluting materials shall be met. No discharge to surface water or groundwater, including direct and indirect discharges of waste, waste effluent, wastewater, pollutants, or cooling water, shall be allowed without approval from appropriate state, county and local agencies.*
6. **Soil Erosion and Sedimentation:** Soil erosion and sedimentation control measures such as, seeding and silt fencing, shall be required before, during, and upon completion of construction where deemed necessary to prevent erosion and sedimentation in accordance with current county and Township standards.

7. **Utility Service:** New utility service distribution lines shall be underground wherever feasible. Any existing utility installations remaining above ground shall not adversely impact neighboring properties and the site. All utility installations shall be carried out in accordance with current standards, rules and regulations of those agencies having jurisdiction.
 8. **Construction:** All construction shall be carried out in accordance with the standards, rules, and regulations of the Township, including the Township Engineer's Construction Design Manual and all applicable ordinances.
- H. Modifications to Approved Site Plans:** Upon application, and payment of the fee in the amount established in the "Schedule of Fees" adopted by the Township Board, modifications to an approved site plan may be granted by the Director of Community Planning and Development provided that such changes conform to the provisions of the Ordinance, and all other Township, county, state and federal laws and regulations.
- I. Effect of Issuance:**
1. The effective date of a site plan shall be ten (10) days from the date of approval. In the event an appeal of the Directors' decision is filed within this ten (10) day period, the effective date of the site plan shall be the date the appeal is decided in favor of the applicant.
 2. A building permit must be approved within twelve (12) months of the effective date of the site plan, otherwise the site plan approved shall be void. For phased developments, the first building permit shall be approved within twelve (12) months and all subsequent building permits shall be issued within five (5) years of the date of site plan approval. Permitted time frames do not change with successive owners.
 3. Approval of a site plan shall authorize only the construction and site improvements as depicted on the approved plans.
- J. Subsequent Permits:** Site improvements related to the approved site plan, excluding grading and foundation permits, shall not commence until the applicant has secured all other permits and approvals required by this ordinance and all other applicable Township, county, state, and federal laws and regulations.
- K. Performance Guarantee:** To guarantee compliance with this ordinance and any conditions imposed by this ordinance, at the time a certificate of occupancy is issued, the Director of Community Planning and Development may require that a cash deposit, certified check, or irrevocable bank letter of credit in a form acceptable to the Township Treasurer, covering the estimated cost of incomplete improvements associated with the approved site plan, be deposited with the Township Treasurer to insure faithful completion of the improvements. As required improvements are completed, portions of a cash deposit or certified check may be rebated. In the case a letter of credit is on file with the Township Treasurer, as work progresses, a new letter of credit may replace the letter of credit on file.
- L. Enforcement:** Conditions and requirements stated as part of the site plan authorization shall be a continuing obligation of the owners of the subject property. Enforcement procedures as set forth in Section 81-5, "Enforcement, Remedies, Penalties", shall apply.
- M. Posting and Other Notification of Decisions:**
1. A list of decisions made on site plans shall be posted by the Director of Community Planning and Development in the Municipal Building of the Charter Township of Meridian and shall include the following:
 - a. Name and location of project.
 - b. Size of project.
 - c. Brief description of project.
 - d. Date the decision to approve, conditionally approve, or deny the project was made.
 2. All decisions shall be listed on the regular Planning Commission agendas and reported to the Township Board.

APPENDIX X:

References

- Barry-Eaton District Health Department. <http://www.barryeatonhealth.org/>
- Capital Area Groundwater Alliance. <http://www.capitalgroundwater.org/>
- City of Battle Creek. <http://www.battlecreekmi.gov/site3.aspx>
- Dean, Lillian F., and Mark A. Wyckoff. *Community Planning & Zoning for Groundwater Protection in Michigan: A Guidebook for Local Officials*. Rochester. Michigan Society of Planning Officials. 1991.
- Creswell, J. (1994). *Research design: Qualitative and quantitative approaches*. London: Sage.
- Denzin, N. K., & Lincoln, Y. S. (2000). Introduction. The discipline and practice of qualitative research. In N. K. Denzin, & Y. S. Lincoln (Eds.). *Handbook of Qualitative Research*, (2nd Ed) (pp.1-28). New York: Sage.
- Environmental Protection Agency- Ground Water. <http://water.epa.gov/type/groundwater/>
- Fontana and J.H. Frey. (2000). The interview: from structured questions to negotiated text. In: N.K. Denzin and Y.S. Lincoln, Editors, *Handbook of qualitative research* (2nd ed.), Sage, Thousand Oaks, CA (2000), pp. 645-672.
- Ingham County Health Department. <http://hd.ingham.org/>
- Kurt Schindler's Land Use Page. <http://web5.msue.msu.edu/lu/index.html>
- Lansing Board of Water and Light. <http://www.lbwl.com/>
- Luukkonen, Carol L. *Model Refinement and Simulation of Groundwater Flow in Clinton, Eaton, and Ingham Counties, Michigan*. U.S. Geological Survey Scientific Investigations Report 2009-5244.
- Maryland DNR's Tool 14: Watershed Protection Program Audit. <http://www.dnr.state.md.us/watersheds/pubs/planninguserguide/tools/Tool14EightToolsAudit.pdf>
- McEwan, Jim. "Michigan DEQ." Michigan Abandoned Well Management Program Overview. Environmental Quality, http://www.michigan.gov/deq/0,1607,7-135-3313_3675_3689-7951-,00.html
- Merriam, S. B. (1998). *Qualitative research and case study applications in education*. San Francisco: Jossey-Bass.
- Michigan Department of Environmental Quality. <http://www.michigan.gov/deq/>
- Michigan Department of Environmental Quality: Water Division, Groundwater Section. *Ground Water Statistics*. June 2003. http://www.michigan.gov/documents/deq/deq-wd-gws-wcu-groundwaterstatistics_270606_7.pdf

MDEQ Well Logic. (2011). http://www.michigan.gov/deq/0,1607,7-135-6132_6828-16124--00.html

National Atlas Map Maker. (2011, March). <http://www.nationalatlas.gov/mapmaker>

Plugging Abandoned Water Wells, Michigan Department of Environmental Quality. January 2007. http://www.michigan.gov/documents/deq/deq-wb-dwehs-wcu-plugabdwells_209016_7.pdf

Stake, R. E. (2000). Case studies. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of case study research* (2nd ed., pp. 435-454). Thousand Oaks, CA: Sage.

Teaming Up for Quality Drinking Water: The Michigan Wellhead Protection Program Guide, Michigan Department of Environmental Quality Drinking Water & Environmental Health Section. (2006, February). http://www.michigan.gov/documents/deq/deq-wb-dwehs-swpu-whpguidebook_256483_7.pdf.

Tri-County Regional Planning Commission. <http://www.tri-co.org/>

US Geological Survey. <http://www.usgs.gov/>

West Side Water. Charter Township of Lansing. <http://www.westsidewater.com/> February 21, 2011.

For more information on the six specific municipalities:

Delhi Charter Township: Community Development.

<http://www.delhitownship.com/CommunityDevelopment.htm>

-Delhi Charter Township: Master Plan 2007.

http://www.delhitownship.com/forms/cd/master_plan.pdf

- Code of Ordinances: Charter Township of Delhi, Michigan. Codified through Ordinance No. 118, adopted May 18, 2010. (Supplement No. 14).

<http://library1.municode.com/default->

[test/home.htm?infobase=12118&doc_action=whatsnew](http://library1.municode.com/default-test/home.htm?infobase=12118&doc_action=whatsnew)

Delta Charter Township: Planning and Zoning.

http://www.deltami.gov/?page_id=87

-Delta Charter Township: Comprehensive Plan 2004. http://www.deltami.gov/wp-content/uploads/2009/08/Comp_Plan.pdf

-Code of Ordinances: Charter Township of Delta, Michigan. Codified through Ordinance No. 10-50, enacted April 19, 2010. (Supplement No. 16).

<http://library1.municode.com/default->

[test/home.htm?infobase=12462&doc_action=whatsnew](http://library1.municode.com/default-test/home.htm?infobase=12462&doc_action=whatsnew)

City of East Lansing: Planning and Development.

<http://www.cityofeastlansing.com/Home/Departments/PlanningDevelopment/>

-City of East Lansing: Comprehensive Plan for our Future 2006.

<http://www.cityofeastlansing.com/Home/Departments/PlanningDevelopment/PlanningResources/ComprehensivePlan/ComprehensivePlan112/>

- Code of Ordinances: City of East Lansing, Michigan. Codified through Ordinance No. 1242, enacted May 5, 2010. (Supplement No. 9). <http://library1.municode.com/default->

[test/home.htm?infobase=13690&doc_action=whatsnew](http://library1.municode.com/default-test/home.htm?infobase=13690&doc_action=whatsnew)

City of Lansing: Planning and Neighborhood Development.

<http://www.cityoflansingmi.com/pnd/index.jsp>

-City of Lansing: Comprehensive Master Plan 1958.

http://www.lansingmi.gov/Lansing/pnd/planning/COMPREHENSIVE_MASTER_PLAN_1960-1980_CREATED_1958.pdf

- Code of Ordinances: Lansing, Michigan. Codified through Ordinance No. 1158, enacted August 30, 2010. (Supplement No. 31).

http://library1.municode.com/defaultnow/home.htm?infobase=13231&doc_action=whatsnew

- West Side Water. Charter Township of Lansing. <http://www.westsidewater.com/> February 21, 2011.

Charter Township of Lansing: Planning and Development.

<http://www.lansingtowship.org/Departments/PlanningandDevelopment/tabid/6649/Default.aspx>

-Charter Township of Lansing: Master Plan 2009-2039.

<http://www.lansingtowship.org/Portals/107/intro.pdf>

- Charter Township of Lansing, Michigan. Codified through Ordinance No. 71.1, adopted September 14, 2010. (Supplement No. 11). http://library1.municode.com/default-test/home.htm?infobase=11132&doc_action=whatsnew

Charter Township of Meridian: Community Planning and Development.

http://www.meridian.mi.us/index.asp?Type=B_BASIC&SEC={91A5A056-F080-414B-9D4F-C6D802AE4AC2}

-Charter Township of Meridian: 2005 Master Plan.

<http://meridiantwpmi.govoffice3.com/vertical/Sites/%7B1800D46E-0900-43BD-B3FA-10A5660870B1%7D/uploads/%7B37EB3B57-3D07-41F0-8123-3291F5B03B2C%7D.PDF>

-Meridian Township Greenspace Plan, 2004.

<http://www.greenwaycollab.com/images/MTGP/MTG%20Low%20Res%20Final%20Greenspace%20Plan%20May%206%202004.pdf>

-Code of Ordinances: Charter Township of Meridian, Michigan. Codified through Ordinance No. 2009-10, effective November 22, 2009. (Supplement No. 8, Rev. 2).

<http://library.municode.com/index.aspx?clientId=13564&stateId=22&stateName=Michigan>