Other stormwater control practices may be needed to mitigate for potential water quality impacts. In addition to detention facilities, other practices, such as vegetated basins/buffers, infiltration basins, and bioswales will be evaluated to minimize transport of sediment, heavy metals, and other pollutants.

Studies show that BMPs such as infiltration basins/trenches, detention basins, and vegetated swales generally have pollutant removal effectiveness of between 50 and 90 percent for TSS with more variable removal percentages for metals (generally averaging between 35 and 85 percent). Sediment particles are a primary component of TSS. Other pollutants such as nutrients, trace metals, and HC have been known to attach to sediments and can be transported in stormwater runoff. As discussed in the FHWA's *Stormwater Best Management Practices in an Ultra-Urban Setting: Selection and Monitoring*, studies suggest that by controlling TSS, other constituents (e.g., metals and nutrients), could also be controlled (Shoemaker et al., 2002); this FHWA document also summarizes water quality BMPs and their pollutant removal effectiveness.

During final engineering, stormwater controls will be designed to meet state and federal regulatory requirements to treat the "first flush" of a storm, as necessary. The first flush is often referred to as the first 0.5 to 1 inch of runoff per impervious area in a drainage basin and typically includes a higher concentration of pollutants compared to later during the storm (Shoemaker et al., 2002; CMAP, 2008).

3.9.4.3 Maintenance

During the winter, practices such as the spreading of deicing salt (e.g., sodium chloride) and snow plowing will be used as necessary to provide public safety. Deicing management practices, such as application of anti-icing chemicals and additives, can minimize salt application quantities. The use of alternative deicing agents could be considered in relation to cost, applicability, feasibility, and public safety. Costs for sodium chloride alternatives tend to be substantially higher, and those alternatives cannot be used in all conditions or locations. In addition, alternatives may present potential adverse water quality impacts that must be taken into consideration. BMPs will be evaluated further in the Tier Two NEPA studies.

Herbicide application will follow the manufacturer's guidelines to minimize drift and runoff into surface waters. An NPDES permit for pesticide point source discharges will be obtained if required.

3.10 Groundwater Resources

This section evaluates the proposed project's potential impact on groundwater quality and quantity, and the potential impacts to community and private water supplies, seeps, and karst topography. Proposed mitigation measures are identified that could mitigate potential impacts to groundwater resources identified due to project construction or operation.

3.10.1 Existing Conditions

The geology of Will County and northeastern Kankakee County ranges in geologic time from Quaternary to Cambrian aged strata. Lake County is also underlain with sedimentary rocks ranging from Quaternary to Cambrian. Groundwater can be obtained from each stratum. In Will County there are two principal sources of groundwater, the unconsolidated aquifer systems and the bedrock aquifers. In Lake County there are three principal sources of groundwater; however, only two occur within the corridors: the unconsolidated Pleistocene glacial till and the consolidated bedrock aquifer systems.

3.10.1.1 Unconsolidated Aquifer Systems of Illinois and Indiana

The corridors contain groundwater resources and aquifers within the surficial glacial deposits (unconsolidated system) and within the shallow and deep bedrock systems (Figure 3-30 and Figure 3-31). Within the surficial deposits, the accessible shallow aquifers can be found in the lenses of sands and gravels of the glacial till (see Section 3.17, Mineral and Geologic Resources for more information regarding surficial geology). The aquifers are connected hydrologically and are recharged directly by seepage from the surface due to precipitation.

In the Indiana portion of the corridors, the unconsolidated aquifer consists of the Valparaiso Moraine Aquifer, a Pleistocene (glacial) deposit of outwash sand and gravel with intermixed clay and silt lenses (Figure 3-32). The aquifer ranges in thickness from 10 feet to more than 130 feet and lies 10 to 100 feet below ground surface. In parts of the aquifer artesian conditions exist because the overlying till behaves as a restrictive layer or aquitard that applies downward force pushing groundwater upward within wells. Consequently, static water levels generally range from 25 to 80 feet below ground surface. This aquifer's susceptibility to contamination ranges from low to high, depending on the thickness of the overlying surface till, topography, and stratigraphy (Indiana DNR, 1994b).

3.10.1.2 Consolidated Aquifer Systems of Illinois and Indiana

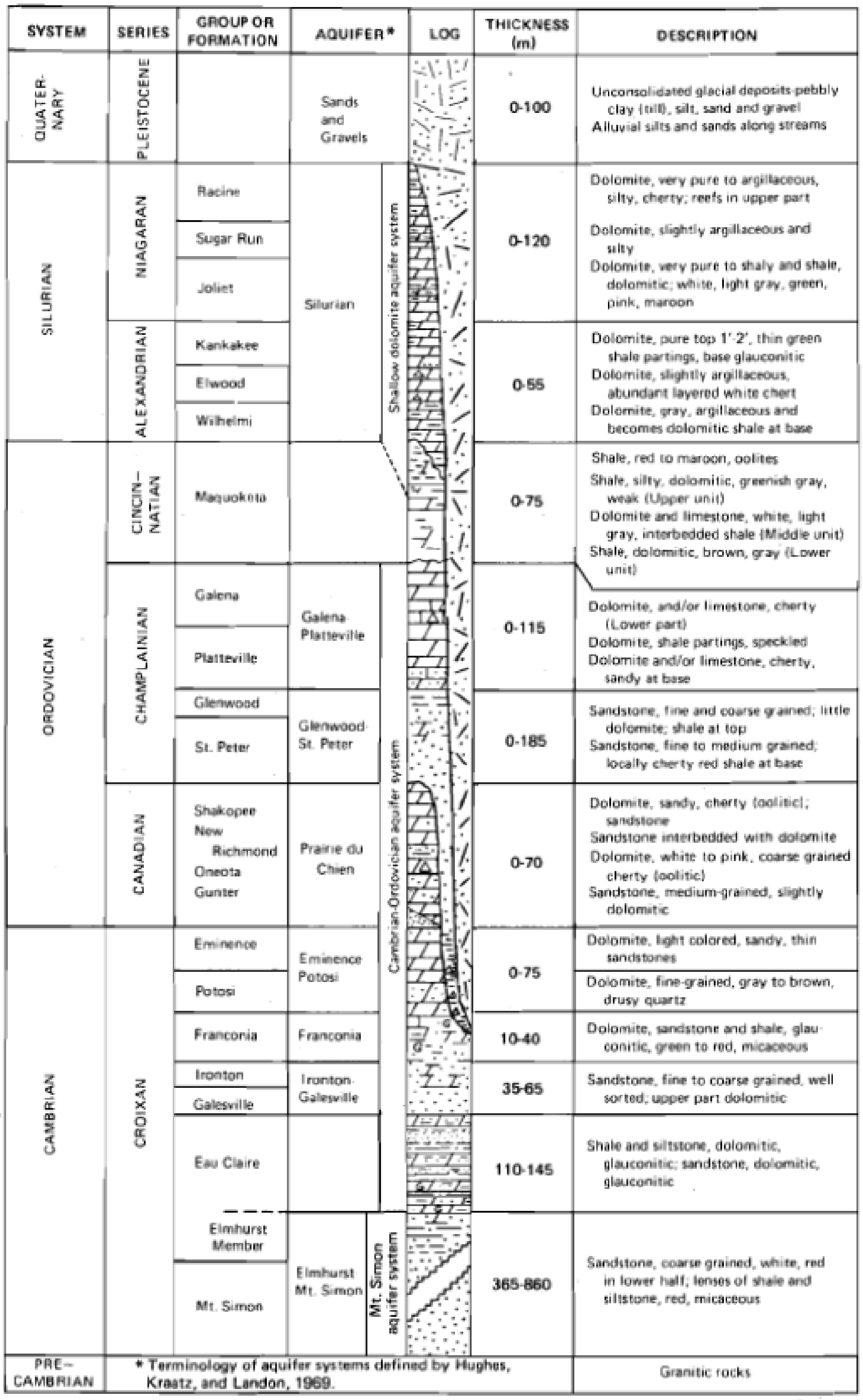
Illinois Consolidated (Bedrock) Aquifer Systems

In the bedrock, the shallow Silurian dolomite (within 300 feet of the ground surface) produces water in varying quantities depending on the presence of water bearing sands in the overlying drift which serve as a source of groundwater to recharge the dolomite (Figure 3-33).

The shallow dolomite aquifer is separated from deeper aquifers by shale of the Maquoketa Group. Below the shale is the Cambrian-Ordovician aquifer, which is the most developed deep aquifer within the Region and consists primarily of the St. Peter, Eau Claire, and Mt. Simon sandstones. This deep aquifer supplies approximately 50 percent of the public water supply in Will County, and has low susceptibility to contamination due to its depth (Woller, 1983).

Erosion has removed the Silurian dolomite southwest of Joliet, Illinois, along the west county line in a 1 to 10-mile wide band arcing across the southwest part of the county through Wilmington, Illinois. In this area the underlying Maquoketa Group forms the

Figure 3-30. Generalized Stratigraphic Units and Aquifers in Northeastern Illinois



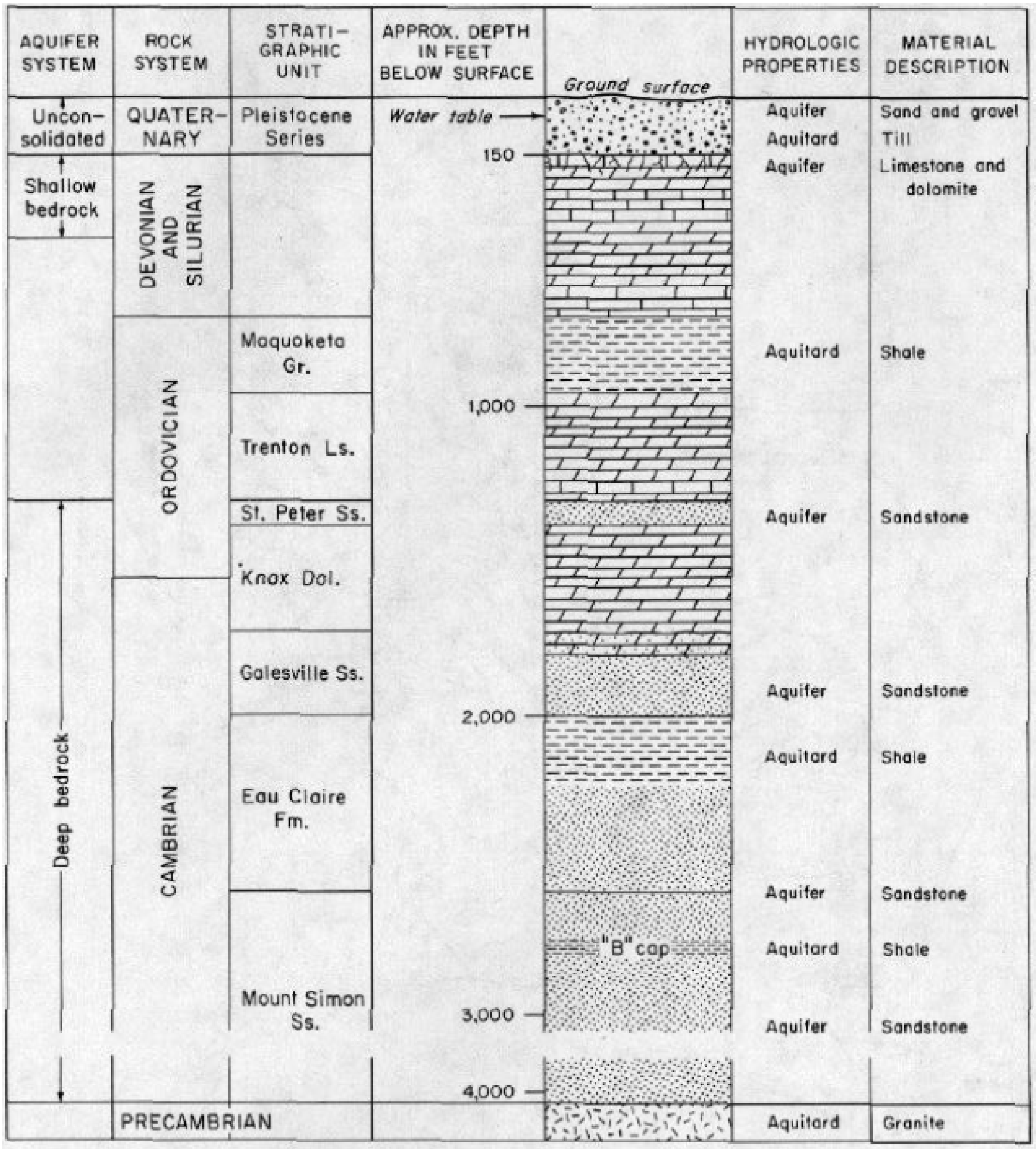
SYSTEM	SERIES	GROUP OR FORMATION	AQUIFER*	AQUIFER SYSTEM	THICKNESS (m)	DESCRIPTION
QUATERNARY	PLEISTOCENE		Sands and Gravels		0-100	Unconsolidated glacial deposits-pebbly clay (till), silt, sand and gravel Alluvial silts and sands along streams
SILURIAN	NIAGARAN	Racine Sugar Run Joliet	Silurian	Shallow dolomite aquifer system	0-120	Dolomite, very pure to argillaceous, silty, cherty; reefs in upper part Dolomite, slightly argillaceous and silty Dolomite, very pure to shaly and shale, dolomitic; white, light gray, green, pink, maroon
SILURIAN	ALEXANDRIAN	Kankakee Elwood Wilhelmi	Silurian	Shallow dolomite aquifer system	0-55	Dolomite, pure top 1'-2', thin green shale partings, base glauconitic Dolomite, slightly argillaceous, abundant layered white chert Dolomite, gray, argillaceous and becomes dolomitic shale at base
ORDOVICIAN	CINCINNATIAN	Maquoketa			0-75	Shale, red to maroon, oolites Shale, silty, dolomitic, greenish gray, weak (Upper unit) Dolomite and limestone, white, light gray, interbedded shale (Middle unit) Shale, dolomitic, brown, gray (Lower unit)
ORDOVICIAN	CHAMPLAINIAN	Galena Platteville	Galena-Platteville	Cambrian-Ordovician aquifer system	0-115	Dolomite, and/or limestone, cherty (Lower part) Dolomite, shale partings, speckled Dolomite and/or limestone, cherty, sandy at base
ORDOVICIAN	CHAMPLAINIAN	Glenwood St. Peter	Glenwood-St. Peter	Cambrian-Ordovician aquifer system	0-185	Sandstone, fine and coarse grained; little dolomite; shale at top Sandstone, fine to medium grained; locally cherty red shale at base
ORDOVICIAN	CANADIAN	Shakopee New Richmond Oneota Gunter	Prairie du Chien	Cambrian-Ordovician aquifer system	0-70	Dolomite, sandy, cherty (oolitic); sandstone Sandstone interbedded with dolomite Dolomite, white to pink, coarse grained cherty (oolitic) Sandstone, medium-grained, slightly dolomitic
CAMBRIAN	CROIXAN	Eminence Potosi	Eminence Potosi	Cambrian-Ordovician aquifer system	0-75	Dolomite, light colored, sandy, thin sandstones Dolomite, fine-grained, gray to brown, drusy quartz
CAMBRIAN	CROIXAN	Franconia	Franconia	Cambrian-Ordovician aquifer system	10-40	Dolomite, sandstone and shale, glauconitic, green to red, micaceous
CAMBRIAN	CROIXAN	Ironton Galesville	Ironton-Galesville	Cambrian-Ordovician aquifer system	35-65	Sandstone, fine to coarse grained, well sorted; upper part dolomitic
CAMBRIAN	CROIXAN	Eau Claire		Cambrian-Ordovician aquifer system	110-145	Shale and siltstone, dolomitic, glauconitic; sandstone, dolomitic, glauconitic
CAMBRIAN	CROIXAN	Elmhurst Member Mt. Simon	Elmhurst Mt. Simon	Mt. Simon aquifer system	365-860	Sandstone, coarse grained, white, red in lower half; lenses of shale and siltstone, red, micaceous
PRE-CAMBRIAN						Granitic rocks

* Terminology of aquifer systems defined by Hughes, Kraatz, and Landon, 1969.

ISGS 1981

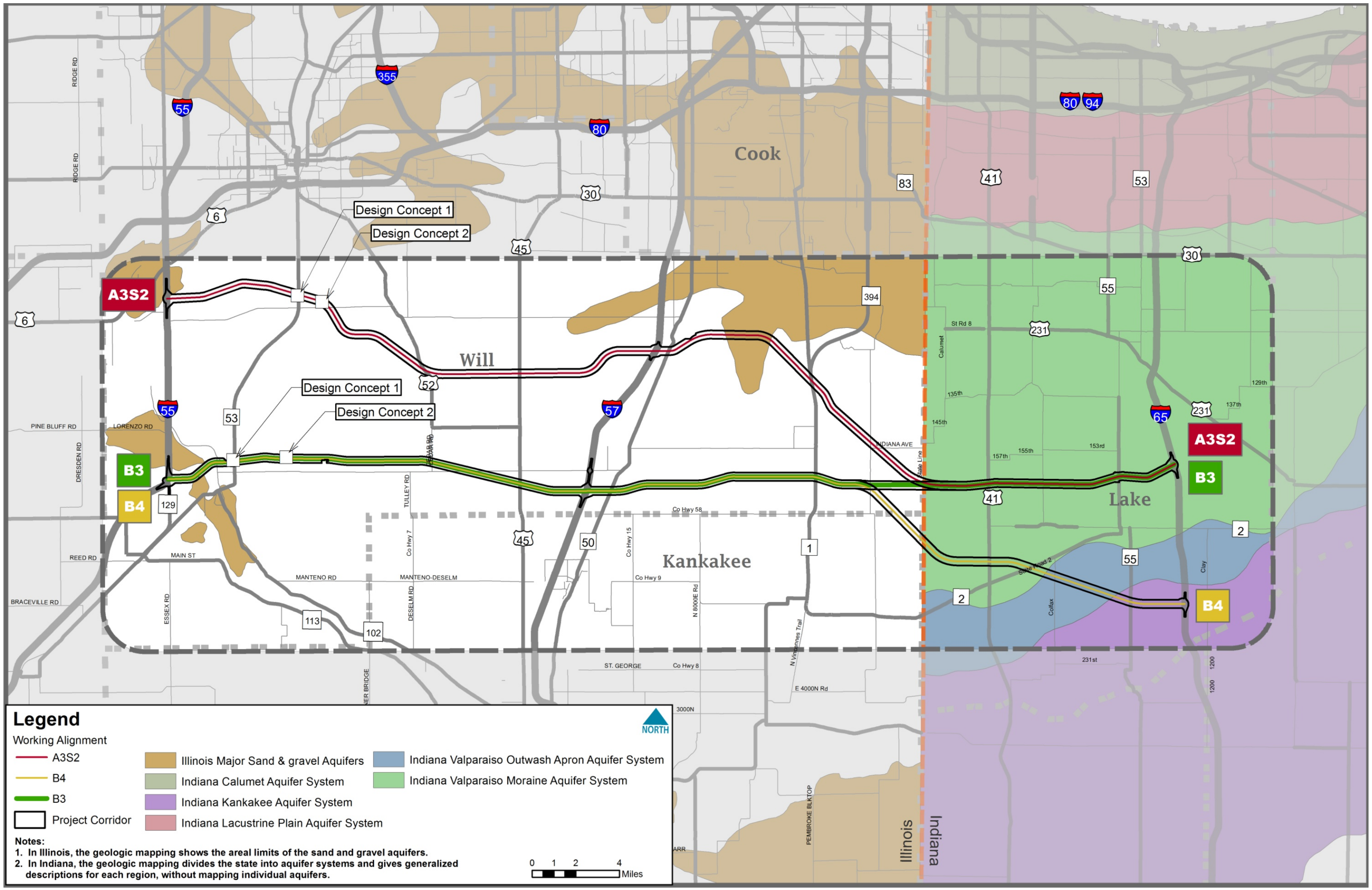
Source: Woller, 1983

Figure 3-31. Geologic Column, Lake County, Indiana Indicating Locations of Aquifer Systems, Hydrologic Properties and Material Descriptions



Source: Hartke, 1975

Figure 3-32. Unconsolidated Aquifer Systems



Sources:
inmap.indiana.edu, Illinois Natural Resources Geospatial Data Clearinghouse

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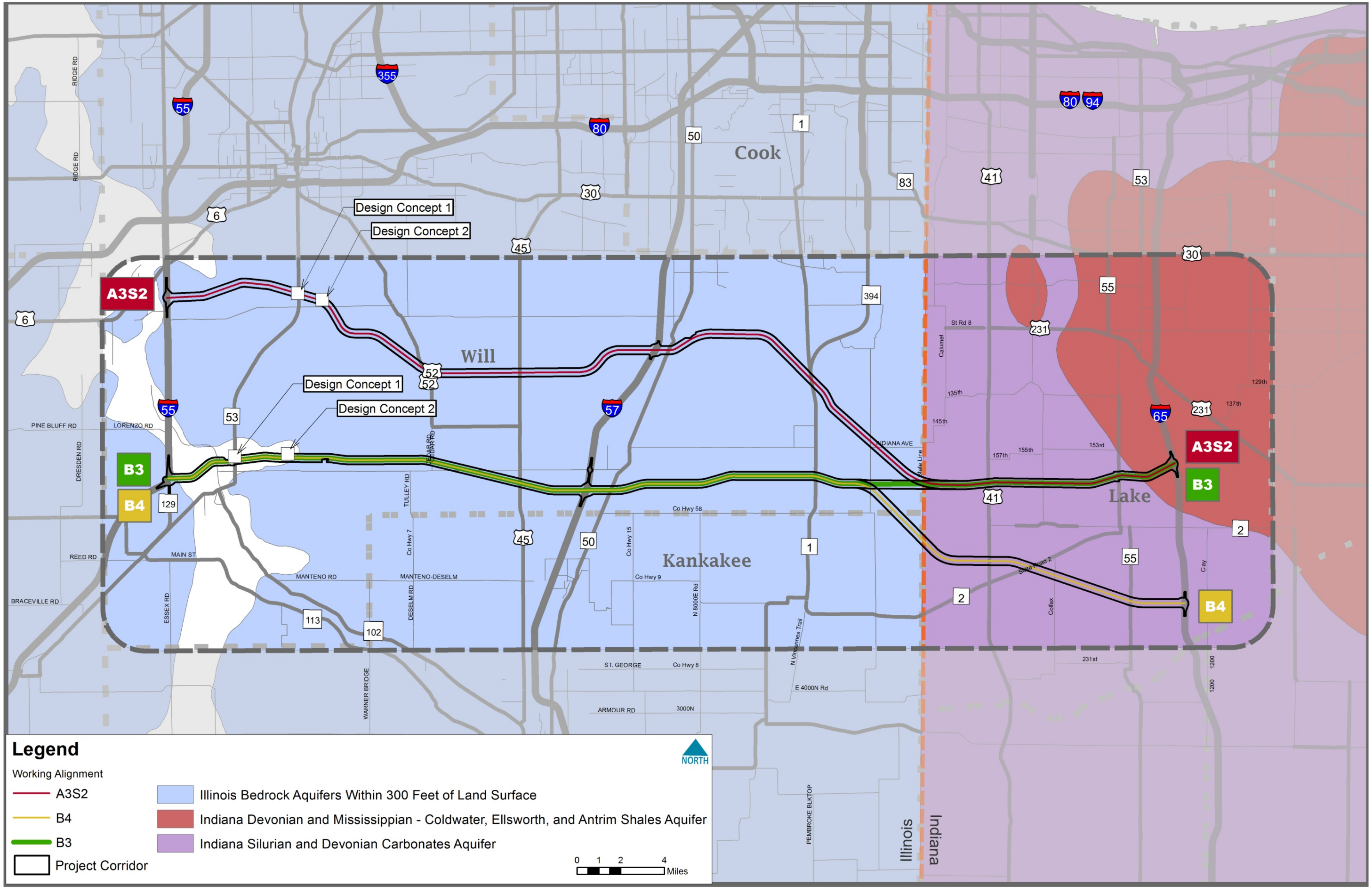
Figure 3-33. Bedrock Aquifer Systems



Sources:
inmap.indiana.edu, Illinois Natural Resources Geospatial Data Clearinghouse

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upper bedrock surface. (See Section 3.17, Mineral and Geologic Resources for more detail regarding bedrock geology in the Study Area.)

Indiana Consolidated (Bedrock) Aquifer Systems

The upper bedrock (consolidated) aquifer consists of the Devonian and Mississippian Coldwater, Ellsworth, and Antrim shale system located in the eastern portion of Lake County. This aquifer is generally not used as a source of groundwater because there is poor productivity due to the presence of impermeable shale; however, to the north and northeast of Crown Point this aquifer is productive. Wells located in this aquifer are generally 150 to 200 feet deep; with the upper 25 feet being the most permeable due to post Devonian surface weathering and the last 50 feet being within the shale. Static water levels range from 40 to 80 feet below the surface. This aquifer is suitable for use mainly by single dwelling users and has a low susceptibility for contamination due to the thick overlying unconsolidated deposits and low permeability (Indiana DNR, 1994a).

Located in the western portion of Lake County, the lower bedrock (consolidated) aquifer consists of the upper 100 feet of the Silurian dolomite within the fracture zone and weathered bedrock surface (Rosenhein and Hunn, 1994). This aquifer is also known as the Silurian and Devonian Carbonates Aquifer and is overlain with 50 to 200 feet of unconsolidated material. The majority of the wells in this system are in the upper 100 feet of the bedrock, while deeper wells may reach 200 to 450 feet into rock. Wells are drilled to an average depth of 230 feet with average static water levels sitting at 117 feet below the surface (Indiana DNR, 1994a).

Recharge to the bedrock aquifers is principally through the deep unconsolidated (glacial) over burden. Additionally, there is upward movement within the dolomite due to head pressure that exceeds the head of the overlying material, creating an artesian situation. This aquifer has low susceptibility to surface contamination because the overlying unconsolidated deposits are relatively thick and there is low permeability of the materials, except where covered by Pennsylvanian units.

The yield capability of the Silurian rocks depends primarily upon the number, size, and degree of interconnection of water filled cracks and crevices within the rock that are penetrated by a well bore. The development of such cracks and crevices and the resulting yield capability of this aquifer are enhanced in some areas where permeable deposits of water bearing sand and gravel in the overlying drift contribute substantial amounts of recharge water.

3.10.2 Methodology of Assessing Groundwater Impacts

Illinois

The analysis of potential groundwater impacts includes an assessment of the existing groundwater conditions in the Corridors A3S2, B3, and B4 as well as the potential impact on groundwater resources. The potential for impacting (or contaminating) groundwater supply wells is dependent upon well construction, proximity to potential sources, and geological conditions. The Illinois Groundwater Protection Act provides guidelines and regulations pertaining to protective setbacks from groundwater wells.

This assessment was based on available data and well locations from the IEPA and Illinois State Geological Survey (ISGS), and a review of the Illinois Groundwater Protection Act (Chapter 415 ILCS Section 55).

Indiana

Indiana protects public water supplies through the 1989 Groundwater Protection Act (Indiana Code [IC] 13-18-17-6) that authorized the Water Pollution Control Board to establish regulations to protect community Public Water Supply Systems (PWSS) well fields from contamination (IC 13-7-26-7). Wellhead protection areas (WHPAs) were authorized by the 1986 Amendments to the Safe Drinking Water Act. When a proposed project encroaches upon a WHPA, the delineated area is identified and coordination with the community's wellhead protection program should be initiated and documented.

The analysis of potential groundwater impacts includes an assessment of the existing groundwater conditions in Corridors A3S2, B3, and B4 as well as the potential impact on groundwater resources. This assessment was based on available data and well locations from IDEM and Indiana State Geological Survey (INSGS). The Indiana DNR 'Water Well Record Database' was used to locate groundwater wells within the corridors (http://www.in.gov/dnr/water/ground_water/well_database/). A potential impact was identified if a well was identified within a corridor.

3.10.3 Well Head Protection Zones and Wells

Illinois

The Illinois Groundwater Protection Act (Chapter 415 ILCS Section 55) establishes setback zones for the location of potential sources of pollution, such as underground storage tanks (USTs) and stockpiles of deicing chemicals. For protections of groundwater, the minimum setback zone around a community water supply well is 1,000 feet and it is 200 feet for private wells. According to the ISGS WHPA Database, there are no wellhead protection areas within the corridors. There are well head protection areas located within Wilmington, Illinois, and Peotone, Illinois, that are outside the limits of the corridors. No sole source aquifers, as defined by section 1424(e) of the Safe Drinking Water Act, are located in the State of Illinois or within the corridors (USEPA, 2008).

Corridor A3S2

According to the ISGS Wells and Borings Database, in the Corridor A3S2, there are 191 water supply wells; two of which are greater than 500 feet deep. In the working alignment within Corridor A3S2 there are 33 water supply wells; two of which are greater than 500 feet deep. According to the IEPA Source Water Assessment Program, there is one well owned by the City of Joliet that is assumed to be a Community Supply Wells in the working alignment within Corridor A3S2. This well is located in the deep aquifer at a bottom depth of 1,548 feet. The identified wells vary in depth from less than 100 feet, to as deep as 1,548 feet; however, the majority of wells are in the 100-300 foot depth range.

Corridor B3

According to the ISGS Wells and Borings Database, in Corridor B3, there are 69 water supply wells; three of which are greater than 500 feet deep. In the working alignment within Corridor B3 there are 24 water supply wells; none of which are greater than 500 feet deep. According to the IEPA Source Water Assessment Program, there are no wells classified as Community Supply Wells in the working alignment within Corridor B3. The identified wells vary in depth from less than 100 feet, to as deep as 770 feet; however, the majority of wells are in the 100-200 foot depth range.

Corridor B4

According to the ISGS Wells and Borings Database, in Corridor B4, there are 69 water supply wells; three of which are greater than 500 feet deep. In the working alignment within Corridor B4, there are 24 water supply wells; none of which are greater than 500 feet deep. According to the IEPA Source Water Assessment Program, there are no wells classified as Community Supply Wells in the working alignment within Corridor B4. The identified wells vary in depth from less than 100 feet, to as deep as 770 feet; however, the majority of wells are in the 100-200 foot depth range.

Indiana

The Safe Drinking Water Act and the Indiana Wellhead Protection Rule (327 IAC 8.4-1) requires protection programs for all community public water systems. Based on a review of the IDEM wellhead protection database, the Town of Lowell's WHPA is located in the working alignment within Corridor B4. No WHPAs are located in Corridors A3S2 or B3. Additionally, there are no Sole Source Aquifers, as designated under Section 1424(e) of the Safe Drinking Water Act, within Corridors A3S2, B3 or B4.

In the Study Area, public drinking water is supplied by private wells and by municipally owned systems. In the corridors, most of the unconsolidated wells appear to be developed in sand and gravel and some fine grained silt and clay. According to the IDEM Wellhead Protection Plan, the Town of Lowell is listed as having a Phase 1 Wellhead Protection Plan in place, and four of the town's seven Water Department wells are located in Corridor B4.

Corridor A3S2

According to the Indiana DNR-DOW water well database, in Corridor A3S2, there are 49 water supply wells; none of which are greater than 500 feet deep. In the working alignment within Corridor A3S2, there are five water supply wells. The identified wells vary in depth from less than 100 feet to 142 feet; however, the majority of wells are less than 100 feet deep.

Corridor B3

According to the Indiana DNR-DOW water well database, in Corridor B3 there are 49 water supply wells; none of which are greater than 500 feet deep. In the working alignment within Corridor B3 there are five water supply wells. The identified wells vary in depth from less than 100 feet to 142 feet; however, the majority of wells are less than 100 feet deep.

Corridor B4

According to the Indiana DNR-DOW water well database, in Corridor B4 there are 37 water supply wells; none of which are greater than 500 feet deep. In the working alignment within Corridor B4 there are five water supply wells. The identified wells vary in depth from less than 100 feet to 325 feet; however, the majority of wells are less than 100 feet deep.

The Lowell Water Department Pumping Station is located approximately 850 feet off the centerline of Corridor B4. The Water Department has seven wells at this facility. Of the seven Lowell Water Department wells at this facility, four are located within the project corridor. One well is located on the centerline of the working alignment within Corridor B4, which would impact the Lowell Water Department due to the loss of one well and would have indirect impacts to the remaining wells and the pumping station. Additionally, coordination would be required with the Town of Lowell and IDEM in regards to their WHPA.

3.10.4 Groundwater Quality

Illinois

In northeastern Illinois, including Will and Kankakee counties, groundwater quality in deep bedrock aquifers is generally considered good, but they do contain naturally occurring constituents that are treated by public water systems as necessary to make groundwater potable. Groundwater quality in shallow aquifers is also generally considered good, but likewise may be affected more by surface contamination. Road runoff, USTs, landfills, septic and agricultural fields, industrial discharges, sewage treatment plants, and atmospheric deposition are common sources of pollutants. Potential contaminants include chloride, total dissolved solids (TDS), heavy metals, herbicides, pesticides, fertilizers, and petroleum compounds. The increase in chloride concentrations in shallow aquifers may be attributed primarily to road salt runoff (ISWS, 2008a; ISWS, 2008b; Kelly and Wilson, 2003).

All wells that are within the working alignments would be properly capped and abandoned. Consequently, the project would not create any new potential routes for groundwater pollution and the project would not be considered a new potential secondary source of groundwater pollution as defined in the Illinois Environmental Protection Act (415 ILCS 5/3.350 and 415 ILCS 5/3.355). Accordingly, the project would not be subject to compliance with the minimum setback requirements for community water supply wells or other potable water supply wells as set forth in 415 ILCS 5/14, et seq. However, in the working alignment within Corridor A3S2 there is a deep aquifer community water supply well owned by the City of Joliet that would have to be coordinated with the City and likely properly abandoned, depending on the final alignment. As defined by section 1424(e) of the Safe Drinking Water Act, no sole source aquifers are located in Illinois (USEPA, 2008).

Additional information regarding the geology of Corridors A3S2, B3, and B4 can be found in Section 3.17.

Indiana

In Lake County, groundwater quality in deep bedrock aquifers contains naturally occurring dissolved constituents consisting of bicarbonate, calcium, magnesium, and sodium. Concentrations of dissolved solids average about 560 ppm. The groundwater is considered to be hard and is treated by public water systems as necessary to make groundwater potable.

Groundwater quality in shallow aquifers is hard and mineralized principally from bicarbonate, calcium, and magnesium, averaging 550 ppm, and may be affected more by surface contamination. Road runoff, USTs, landfills, septic fields, industrial discharges, sewage treatment plants, and atmospheric deposition are common sources of pollutants. Potential contaminants include chloride, TDS, heavy metals, and petroleum compounds. The increase in chloride concentrations in shallow aquifers may be attributed primarily to road salt runoff.

There are no public water supply impoundments in or adjacent to Corridors A3S2 and B4 and no impacts to local public water supplies are anticipated. However, in and adjacent to Corridor B4, there are nine municipal owned wells (two owned by the Town of Lowell and seven owned by the Lowell Water Department). Additionally, the Lowell Water Department pumping station is located approximately 850 feet from the centerline of the Corridor B4. Four of the seven Lowell Water Department wells are located within Corridor B4; one of which is located on the centerline of the working alignment within Corridor B4. Based on the IDEM Wellhead Protection Plan, the Town of Lowell is listed as having a Phase 1 Wellhead Protection Plan in place (http://www.in.gov/idem/files/wellhead_comm__pws_database.pdf). The working alignment within Corridor B4 would impact the Lowell Water Department due to the loss of one well and would have indirect impacts to the remaining wells and pumping station.

For the corridors, where groundwater from municipal, private, and individual wells is the principal source of potable water, there is the potential that road surface stormwater runoff from the new roadway could impact drinking water in the area.

3.10.5 Seeps

Within the corridors it is likely that there are natural water regimes that rely on groundwater either constantly or intermittently, such as seeps, springs, wetlands, and streams. Seeps are likely to occur at the toe of steep hillsides or along stream or river corridors. Seeps are known to occur along the Des Plaines and Kankakee rivers and are likely to occur at various locations associated with the streams that cross the corridors. The project would not likely have a substantive effect on the quantity or quality of groundwater reaching seeps because the overall net increase in impervious area as compared to the overall surface area of the groundwater recharge area is small. The project will provide stormwater detention and BMPs that will promote infiltration and groundwater recharge, thus mitigating the potential impact of the new impervious area.

3.10.6 Karst Topography

Karst topography is characterized by numerous caves, sinkholes, fissures, and underground streams. Karst topography usually forms in areas of plentiful rainfall where bedrock consists of carbonate-rich rock, such as limestone, gypsum, or dolomite that may be dissolved. Surface streams may be absent in areas with karst topography.

The Study Area does not contain karst topography. The nearest karst topography in Illinois is located along the Mississippi River in northwest and southwest Illinois. In Indiana, the nearest karst topography is located in southern Indiana. Additional information regarding geology can be found in Section 3.17.

3.10.7 Mitigation

Measures to mitigate water quality impacts are described conceptually below. They will be discussed in greater detail within the Tier Two NEPA studies.

The basis for mitigation measures is implementation of BMPs and the treatment and filtering of stormwater runoff prior to it infiltrating and becoming groundwater. These BMPs will also be implemented to minimize the volume of stormwater runoff discharge. Installation of BMPs will result in physical, chemical, or biological pollutant load reduction, increased infiltration, and evapotranspiration (plant respiration). Proper soil erosion and sediment control measures will be used to minimize erosion and sedimentation from the project. These measures are a condition of Section 404 CWA permits, prescribed in design and construction guidance by each state, and will be coordinated with the local SWCD. Erosion control measures will consist of applying mulch, straw, soil tackifier, polymers, erosion control blankets, and vegetative soil stabilization. Generally, vegetative soil stabilization includes temporary and permanent seeding, sodding, ground cover, and dormant seeding. Disturbance of streamside and riparian vegetation will be kept to a minimum. In stream construction and soil disturbing activities near streams will be conducted during low or normal flow periods in accordance with construction permits obtained prior to construction. Discharge points will be protected with rock (or an alternative measure) to minimize scour and erosion.

Installation of soil erosion and sediment control devices such as perimeter silt fence, stabilized construction entrances, drainage inlet protection, ditch checks, diversions, sediment traps, and other appropriate BMPs before commencing soil disturbing activities will be used to filter runoff, remove contaminants, reduce erosion and control sediment and runoff to protect receiving waters during construction. These BMPs will also help to minimize sediment deposition and maintain pool volume and infiltration capacity of detention ponds and other stormwater management facilities, thereby, minimizing potential water quality degradation of the infiltrated waters and receiving streams.

Stormwater facilities and discharges will be monitored and managed during and following construction in accordance with the requirements of the General NPDES Illinois permit numbers ILR10 and ILR40 and the Indiana 327 IAC 15-5, Rule 5.

Other stormwater control practices may be needed to mitigate water quality impacts. In addition to detention facilities, other practices such as vegetated basins/buffers, infiltration basins, and bioswales will be evaluated to minimize transport of sediment, heavy metals, and other pollutants. Deicing management practices, such as anti-icing chemicals and additives, can minimize salt application quantities. These practices will be evaluated further in the Tier Two NEPA studies.

Accidental spills of hazardous materials and wastes during construction or operation of the transportation system require special response measures. Occurrences will be handled in accordance with local government response procedures. Refueling, storage of fuels, or maintenance of construction equipment will not be allowed within 100 feet of wetlands or water bodies to minimize the potential impact accidental spills may have on these resources.

3.11 Floodplains

This section describes existing floodplains, floodways, and potential impacts from the project. Existing floodplains and floodways near the corridors described in Section 3.11.1 are based on the Federal Emergency Management Agency (FEMA) National Flood Insurance Program (NFIP) regulatory floodplain and floodway mapping. The methodology used to assess floodplain and floodway impacts is described in Section 3.11.2. Impacts to the floodplain and floodway and potential mitigation are provided in Section 3.11.3 and 3.11.4.

3.11.1 Existing Conditions

Floodplains are extensions of waterways where water rises and expands into additional overbank storage areas. Within vegetated areas, floodplains provide an opportunity for infiltration and water quality treatment through filtering of nutrients, sediment, and impurities. Beneficial values of floodplains include, but are not limited to, the moderation of floods, water quality enhancement, groundwater recharge, fish and wildlife habitat, open space, and recreational value.

Based on Illinois Administrative Code, Title 17 (Conservation) and the Indiana Drainage Handbook (Indiana DNR - DOW, 1999), floodplain and floodway are defined as follows:

- *Floodplain* means the channel and the areas adjoining any wetland, lake, or watercourse that have been or hereafter may be covered by the regulatory flood. The floodplain includes both the floodway and the flood fringe.
- *Regulatory Floodplain* is defined as that land adjacent to a body of water with ground surface elevation at and below the 100-year frequency flood elevation.
- *Floodway* is the portion of the floodplain that is reasonably required to efficiently carry and discharge the peak flood flow of any river or stream.