ANNUAL REPORT FOR ACTIVE IDOT WETLAND COMPENSATION AND HYDROLOGIC MONITORING SITES

September 1, 1999 to September 1, 2000

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INTRODUCTION

This report was prepared by the Illinois State Geological Survey (ISGS) to provide the Illinois Department of Transportation (IDOT) with hydrogeologic data collected from wetland compensation sites and potential wetland compensation sites being monitored under contract (IDOT SW PESA&WI WIP MILLER). Where appropriate, this report also includes a determination of areas meeting wetland hydrology criteria listed in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual (U.S. Army Corps of Engineers 1987). Additional activities performed under this contract, such as water-quality monitoring, are not included in this report. Other site observations are included where appropriate.

Summaries of 25 sites are included in this report. Most summaries contain a location map, a site map showing monitoring wells and other field instruments, hydrographs for selected monitoring wells, and local precipitation data for the period. Sites where wetland compensation activities have been performed include a map showing the extent of areas satisfying wetland hydrology criteria. A list of all sites and their locations is shown in Figure 1. All data included in this report are from September 1, 1999 to September 1, 2000 at IDOT's request.

METHODS

Measurement of the area within each wetland compensation site that satisfies the wetland hydrology criteria of the U.S. Army Corps of Engineers Wetland Delineation Manual (U.S. Army Corps of Engineers 1987) is a main focus of this report, and the following criteria are used. An area that conclusively satisfies wetland hydrology criteria will be inundated or saturated for no less than 12.5% of the growing season. Inundation occurs when surface water is present at depths no greater than 2 meters (m) (6.6 feet) (ft). Saturation occurs when the water table is no deeper than 30 centimeters (cm) (1 ft) below land surface. Inundation or saturation for 5% to 12.5% of the growing season may satisfy wetland hydrology criteria but are not considered conclusive. For the purposes of this report, only areas that conclusively satisfy the criteria are included in calculations and shown on maps.

The Midwestern Climate Center (MCC) provides data regarding the length and beginning date of the growing season (Midwestern Climate Center 2000). The growing season is defined as the time period between the last occurrence of 28°F air temperatures in spring to the first occurrence of 28°F air temperatures in the fall. The median beginning date and length of growing season is calculated by the MCC for individual climate observation stations throughout the state. Data from the nearest observation station with an adequate period of record are used for each site.

Wells and stage gauges where water levels satisfied wetland hydrology criteria are listed in the text for each site. Interpolation between measuring points and/or extrapolation are used to locate the boundary of the area that satisfies wetland hydrology criteria. Best professional judgement is used to refine the location of this boundary, using small-scale topographic features, vegetation, soils, and other features. To measure the size of an area satisfying wetland hydrology criteria, the boundaries were plotted on the best available base map, then measured with a Tamaya Super Planix B digital planimeter and listed in acres (ac) and hectares (ha). Boundaries shown on the maps are dashed to indicate a larger uncertainty where data are scarce. Where other methods are used to measure this area, they are noted in the site summaries.

The accuracy of each area measurement will vary significantly depending on the accuracy of the underlying base map, the accuracy in locating monitoring devices, and the accuracy of the

Active IDOT Water-Level Monitoring Sites September 1, 1999 to September 1, 2000





planimeter at the scale of the base map. The base maps used for these determinations include as-built surveys (done both by IDOT and ISGS), construction plans, U.S. Geological Survey 7.5-minute topographic maps, and unrectified aerial photographs. It is expected that in no case is the error of the acreage calculation less than $\pm 1.5\%$ and could be much greater. Given the several sources of potential error, estimates of error are difficult to calculate and are not included. Measurements at each site are given with appropriate numbers of significant digits to reflect the precision in the base map and other sources of error in the calculation.

Water-level data were collected monthly throughout the year, and biweekly during April and May when highest water levels are generally observed. However, this year many sites required biweekly readings through June, July, and August when highest water levels occurred due to a dry spring followed by heavy summer rains.

Given that 12.5% of the growing season ranges from about 22 days to 28 days in different parts of Illinois, a minimum of three consecutive biweekly measurements are generally required to conclusively satisfy wetland hydrology criteria. If only two consecutive measurements were collected that indicated wetland hydrology criteria, interpolation of the water levels was performed to determine total number of days of inundation or saturation. In no case will one measurement be considered sufficient to indicate that a site satisfies wetland hydrology criteria. Flooding that prevents measurement of a site is considered sufficient evidence of inundation for that period of measurement. Manual collection of water-level measurements is often supplemented with various automated data logging devices that measure daily or more frequently. These data loggers are used to determine the timing of hydrologic events that are not recorded in manual measuring.

Monitoring wells are given an alphanumeric designation based in part on their relative depths. Monitoring wells designated with an "S" or "VS" are the most shallow type and are specifically constructed for measuring wetland hydrology. Monitoring wells designated with a "U" (upper) are deeper than "S" wells, and may be used to determine wetland hydrology depending on the depth of the well screen. In larger sites, "U" wells used to determine wetland hydrology are graphed with "S" and "VS" wells. Other types of wells, including "M", "L", and "D", are deeper wells used to collect other hydrogeologic data and cannot be used to determine wetland hydrology. They are included only to document ISGS activities at the site, and they are discussed in other types of ISGS contract reports to IDOT. Graphs with each site report show water-level elevations at each well and other instruments, and depth to water below land surface at each well. Depths are shown as negative when water levels are above land surface. Elevations at most sites are shown relative to the National Geodetic Vertical Datum (NGVD) of 1929; any variations to this are clearly labeled.

The water levels recorded during the year are shown in the charts accompanying each site summary. For small sites, all measurements will be shown on the same chart. For sites with more instruments, similar types of instruments are grouped on individual charts, for example all "S" wells may be on a single chart. For the largest sties, there may be several charts for a single type of instrument.

On-site precipitation data were collected by ISGS using several types of tipping bucket rain gauges. Because all ISGS gauges are nonheated and must be removed in the winter, monthly precipitation data are also shown from climate observation stations maintained by the MCC (MCC 2000). The closest weather station with an adequate period of record is used at each site. Normal (or mean, or average) precipitation values, and the above and below normal-range threshold values are calculated by the National Water and Climate Center (NWCC) (NWCC 2000) and are all based on the 30-year period between 1961 and 1990. Precipitation is classified as being within the normal range when the level recorded is within a 30% probability above or below the mean based on a 2-parameter gamma distribution over the 30-year period (NWCC 1995). Precipitation is classified as above or below the normal range when the recorded level is not within the normal range as defined above. "Above 30% threshold" refers to the value at which there is a 30% chance precipitation will be greater than or equal to the value shown. "Below 30% threshold" refers to the value at which there is a 30% chance precipitation will be less than or equal to the value shown.

It is expected that accuracy will be improved in the 2001 report. Global Positioning System (GPS) data have not yet been collected from every site, and are expected to more accurately locate site boundaries, instruments, and other important features leading to a more accurate area measurement at all sites. Direct measurement of areas of wetland hydrology may be possible using GPS (*e.g.* Hickory Grove site), which would avoid the errors inherent in transferring data to maps for measurement. Finally, orthophotographs are expected to become available for more sites, thus removing additional error.

This document is intended to be a summary of all data collected under this contract, and some detail is omitted. For example, each gap in data is not explained. There may be many reasons for such a gap, including instrument failure, lack of water, frozen conditions, no reading, or others. We expect that questions may arise from an examination of data at each site, and that detailed explanation will be required. We also expect that detailed discussion or reference to other types of ISGS reports on each site will be required prior to using the included data. Any questions that arise should be directed to the specific site manager.

REFERENCES

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- Nugteren, AK, J.E. Olson, and T. Brooks, 1991, FAP 307 Wetland Determination and Delineation, Mitigation Site Assessment: Illinois Natural History Survey, Champaign, unpublished report to Illinois Department of Transportation, 3 p.
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- Wilm, B.W., S. Wiesbrook, R.L. Larimore, and B. Zercher, 1999, 1999 Wetland Monitoring Report for the Illinois Department of Transportation Wetland Mitigation Site, Perry County, Illinois: Illinois Natural History Survey unpublished contract report, Champaign, IL, 29 p.

KLEIN CREEK POTENTIAL WETLAND COMPENSATION SITE FAP 307 Du Page County, near Carol Stream, Illinois Primary Project Manager: Christine S. Fucciolo Secondary Project Manager: James J. Miner

SITE HISTORY

- Spring 1993: ISGS began to measure surface- and ground-water levels at the site.
- December 1994: ISGS submitted a final hydrogeologic characterization report to IDOT (ISGS Open File Series 1994–8).
- January 1998: Additional monitoring wells were installed to measure perched water-table elevations.
- Summer 1998: Huddleston-McBride Co. searched the site for drainage tile, and submitted a map to IDOT.
- May 2000: ISGS received permission from IDOT to discontinue water-level monitoring in the field west of Klein Creek. Data collection in the west field ended on May 23, 2000.
- May 2000: ISGS continues to monitor water-levels in the field to the east of Klein Creek. ISGS installed an Infinities sonic data logger over Klein Creek at Kuhn Road to evaluate using the creek as a water source for wetland creation in the field east of the creek.

WETLAND HYDROLOGY CALCULATION FOR 2000

Klein Creek is a potential wetland compensation site. No calculation of the area that satisfies wetland hydrology criteria is needed, but a figure showing these areas is included for planning purposes. The calculations for wetland hydrology are based on the following factors.

- According to the Midwestern Climate Center, the median date that the growing season begins in Wheaton is April 28 and the season lasts 182 days; 12.5% of the growing season is 23 days.
- Precipitation was below the normal range in October and November 1999, and in March 2000. These months fall within a generally dry period between September 1999 and March 2000. Precipitation was above the normal range in April, May, and June 2000.
- In 2000, water levels measured in well 14S conclusively satisfied the wetland hydrology criteria of the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. Waterlevels in well 12SR may satisfy the criteria. These results are similar to those obtained in 1998 and 1999.

PLANNED FUTURE ACTIVITIES

• Monitoring of Klein Creek and the field to the east of Klein Creek will continue until no

longer required by IDOT.

• If wetland construction occurs, ISGS will install instruments to monitor the areal extent of wetland hydrology.

RECOMMENDATIONS

• Based on water levels measured in 2000, excavation of less than 30 cm (1 ft) is expected to create wetland hydrology in the vicinity of well 12SR. Excavation of 46 to 61 cm (1.5–2 ft) may be necessary to create wetland hydrology in the vicinity of 11SR.

Klein Creek Potential Wetland Compensation Site (FAP 307)

General Study Area and Vicinity

from the USGS Topographic Series, West Chicago, IL 7.5-minute Quadrangle (USGS 1993)

contour interval is 10 feet



Klein Creek Potential Wetland Compensation Site (FAP 307)

Estimated Areal Extent of 2000 Wetland Hydrology

based on data collected between September 1, 1999 and September 1, 2000 map based on West Chicago, IL 7.5-minute Quadrangle (USGS 1962)



Klein Creek Potential Wetland Compensation Site September 1, 1999 to September 1, 2000



Water-Level Elevations

Klein Creek Potential Wetland Compensation Site September 1, 1999 to September 1, 2000



Depth to Water

Klein Creek Potential Wetland Compensation Site September 1999 through August 2000

Total Monthly Precipitation Recorded On Site and at the Wheaton, IL Weather Station



on-site rain gauge not deployed for entire month* see text for explanation

Graph last updated September 15, 2000

ISGS #09

VETERAN'S PARKWAY, SPRINGFIELD WETLAND COMPENSATION SITE FAP 662 Sangamon County, near Springfield, Illinois Project Manager: Blaine A. Watson Secondary Project Manager: Geoffrey E. Pociask

SITE HISTORY

- Spring 1997: ISGS initiated water-level monitoring to determine pattern of water-level fluctuation in the ponded area. Water in the ponded area was monitored throughout most of the growing season in 1997. Water level increases were strongly associated with storm events. Upon determining the relationship between water levels in the pond and the adjacent creek, monitoring of the pond was discontinued in Fall 1997.
- July 1999: Water-level monitoring for the purpose of determining the extent of wetland hydrology was initiated at the request of IDOT. Three "S" wells were installed in the shallow exposed shelf in the northwestern corner of the excavation. A surface-water data logger was installed to monitor pond water levels.
- December 1999: The surface-water data logger was destroyed during a high-volume surface-water inflow event in the fall of 1999. A staff gauge (B) was installed as a short-term replacement for the surface-water data logger.
- March 2000: A replacement surface-water data logger (gauge C) was installed. A rain gauge was also installed at the site.
- July 2000: A new staff gauge (D) was installed in the vicinity of the new surface-water data logger and the old staff gauge (B) was removed. GPS data regarding the positions of site instruments and photo-identifiable site features were collected.

WETLAND HYDROLOGY CALCULATION FOR 2000

Based on as-built surveys provided by IDOT, we estimate that the total area of created wetland that conclusively satisfied wetland hydrology criteria in 2000 is 4.6 ac (1.9 ha) out of an excavation of 7.1 ac (2.8 ha). This estimate is based on the following factors.

- According to the Midwestern Climate Center, the median date that the growing season begins in Springfield is April 6 and the season lasts 209 days; 12.5% of the growing season is 26 days.
- Precipitation was below the normal range in November 1999 and January, April, and May 2000 during a dry period that began in Summer 1999. Precipitation was within the normal range or greater than the normal range in June, July, and August 2000.
- In 2000, water levels measured in well 3S conclusively satisfied the wetland hydrology criteria of the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. The surface-water data logger indicated that inundation occurred to an approximate elevation of 156.8 m (514.4 ft) for 12.5% (26 days) of the growing season as a result of heavy rains

in June and July. Water levels in wells 1S and 2S did not conclusively satisfy the wetland hydrology criteria.

- Limitations of the wetland hydrology determination are as follows:
 - The calculation was based on as-built surveys provided by IDOT. Based on the hydrograph of the surface-water data logger and the ground-surface elevation at well 3S, requirements for wetland hydrology were determined to have been met for all land-surface elevations below 156.8 m (514.4 ft). Wetland acreage was measured on an IDOT as-built drawing by following the 156.8 m (514.4 ft) contour line and planimetrically determining the area.
 - The aerial photograph used as a base for the figure has not been rectified or georeferenced. Therefore, ground-surface elevations of the wells were resurveyed in Spring 2000 and the GPS coordinates of all instruments were determined during July 2000. The positions of instrument and photo-identification points determined via GPS were plotted at the same approximate scale as the aerial photograph and were then overlain on the aerial photograph based on best-fit visual reference to known photo-identification points.
 - Water-level elevations determined with the surface-water data logger were consistently 8 to 10 cm (approximately 0.3 ft) higher than those observed on the manual staff gauges. This discrepancy was accounted for in making the wetland hydrology determination based on inundation elevation; *i.e.* the data logger indicated an elevation of 156.9 m (514.8 ft) would be satisfactory but we employed an elevation of 156.8 m (514.4 ft) in making the determination. This discrepancy is thought to be a calibration effect and will be remedied when recalibration is conducted prior to Spring 2001.

PLANNED FUTURE ACTIVITIES

• The current monitoring scheme will be continued in 2001. The surface-water data logger will be removed and recalibrated during the winter months and will be reinstalled and resurveyed in early 2001.

Veteran's Parkway, Springfield Wetland Compensation Site (FAP 662)

General Study Area and Vicinity

from the USGS Topographic Series, Springfield West, IL 7.5-minute Quadrangle (USGS 1965) contour interval is 10 feet



Veteran's Parkway, Springfield Wetland Compensation Site (FAP 662)

Estimated Areal Extent of 2000 Wetland Hydrology

based on data collected between September 1, 1999 and September 1, 2000

map based on unrectified aerial photography from IDOT (R-5208C, 11/19/98)



Veteran's Parkway, Springfield Wetland Compensation Site September 1, 1999 to September 1, 2000



Veteran's Parkway, Springfield Wetland Compensation Site September 1, 1999 to September 1, 2000



Veteran's Parkway, Springfield Wetland Compensation Site September 1999 through August 2000

Total Monthly Precipitation Recorded On Site and at the Capital Airport Weather Station, Springfield, IL



on-site rain gauge not deployed for entire month * see text for explanation

Graph last updated September 20, 2000

HANNIBAL BRIDGE WETLAND COMPENSATION SITE FAP 319 Pike County, near East Hannibal, Illinois Project Manager: Blaine A. Watson Secondary Project Manager: Geoffrey E. Pociask

SITE HISTORY

- October 1992: ISGS installed monitoring wells and began a hydrogeologic characterization.
- June 1995: ISGS submitted a draft final hydrogeologic characterization report to IDOT.
- July 1997: IDOT completed construction of the created wetland by excavating a basin.
- March 1998: ISGS submitted the final hydrogeologic characterization report to IDOT (ISGS Open File Series 1998–2).
- December 1999: ISGS installed 3 new "S" wells to better monitor the western portion of the excavation basin. ISGS also installed gauge D to replace gauge B in Bird Slough along the western site boundary.
- July 2000: ISGS collected GPS data on the locations of site instrumentation and excavation boundaries for use in the annual report.

WETLAND HYDROLOGY CALCULATION FOR 2000

Based on post-construction aerial photography provided by IDOT, we estimate that the total area of created wetland that conclusively satisfied wetland hydrology criteria in 2000 is 16.0 ac (6.5 ha) out of an excavation of 17.4 ac (7.0 ha). This is comparable to an area of 16.5 ac (6.7 ha) in the previous year. This year's estimate is based on the following factors.

- According to the Midwestern Climate Center, the median date that the growing season begins in Hannibal, Missouri, is April 7 and the season lasts 211 days; 12.5% of the growing season is 26 days.
- Overall precipitation was below the normal range during September, October, and November 1999 and in April, May and August 2000. Precipitation was at or above the normal range during February, March, June, and July 2000.
- In 2000, with the exception of wells 20S and 5U, water levels measured in all "U" and "S" wells within the excavation conclusively satisfied the wetland hydrology criteria of the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual.
- Limitations of the wetland hydrology determination are as follows:
 - The calculation was based on aerial photography provided by IDOT.
 - The calculation does not include any area attributable to the natural, pre-existing wetland along the west-central border of the site.
 - Ground-surface elevations of the wells were resurveyed in Spring 2000 and the

GPS coordinates of all instruments were determined during July 2000. However, the aerial photograph used as a base for the figure has not been rectified or georeferenced. Therefore, the positions of instrument and photo-identification points determined via GPS were plotted at the same approximate scale as the aerial photograph and were then overlain on the aerial photograph based on best-fit visual reference to known photo-identification points.

PLANNED FUTURE ACTIVITIES

• Monitoring will follow the existing protocol through July 2002 or until no longer required by IDOT.

Hannibal Bridge Wetland Compensation Site (FAP 319) General Study Area and Vicinity

from the USGS Topographic Series, Hannibal East, IL-MO 7.5-minute Quadrangle (USGS 1971) contour interval is 5 feet east of the Mississippi River and 20 feet west of the Mississippi River



Hannibal Bridge Wetland Compensation Site (FAP 319)

Estimated Areal Extent of 2000 Wetland Hydrology

based on data collected between September 1, 1999 and September 1, 2000

map based on unrectified aerial photography from IDOT (May 2, 2000)





estimated areal extent of 2000 wetland hydrology

estimated areal extent of excavated basin

- O monitoring well
- stage gauge
- △ RDS data logger
- 容 rain gauge



Water-Level Elevations

Depth to Water in Wells Used to Determine Areas Satisfying Wetland Hydrology Criteria



Water-Level Elevations in Deeper Monitoring Wells



Depth to Water in Deeper Monitoring Wells





Hannibal Bridge Wetland Compensation Site September 1999 through August 2000

Total Monthly Precipitation Recorded On Site and at the Hannibal Water Works Weather Station, Hannibal, MO



on-site rain gauge not deployed for entire month
* see text for explanation

Graph last updated September 15, 2000

SAND ROAD WETLAND COMPENSATION SITE FAP 310 Madison County, near Poag, Illinois Primary Project Manager: Steven E. Benton Secondary Project Manager: Bonnie J. Robinson

SITE HISTORY

- April 1996: IDOT issued a task order to the ISGS to conduct a detailed mitigation site assessment.
- August 1996: The hydrogeologic characterization of the site was initiated with the installation of monitoring wells and staff gauges.
- July 1997: An interim hydrogeologic characterization report was submitted to IDOT.
- Fall 1998: A berm, incorporating a water control structure, was built along the south margin of the site.
- March 1999, November 1999, May 2000: Twelve soil-zone (S) monitoring wells were
 installed. Six of the wells (2S, 5S, 7S, 8S, 14S, 16S) were used to better define the area
 of wetland hydrology. The other six wells (17S, 18S, 19S, 20S, 21S, 22S) were used to
 determine the nature of the transition zone from wetland to non-wetland hydrology along
 the slope of the sand terrace.

WETLAND HYDROLOGY CALCULATION FOR 2000

The area that conclusively satisfied the wetland hydrology criteria in 2000 is estimated to be 9.7 ac (3.9 ha). This is about 2.3 ac (0.9 ha) less than in 1999 and is probably due to an extended period of below normal precipitation that started in September 1999. This estimate is based on the following factors.

- The median (1961–1990) length of the growing season, as measured at the Belleville SIU Research Station, is 203 days (April 5 to October 24); 12.5% of the growing season is 25 days.
- Precipitation was below the normal range in September and November 1999 as part of a dry period starting in Summer 1999. Precipitation in May, June, July, and August 2000 was above the normal range.
- In 2000, water levels measured in the following wells conclusively satisfied the wetland hydrology criteria of the 1987 U.S. Army Corp of Engineers Wetland Delineation Manual: 21S. Water levels measured in wells 5S, 7S, 8U, 13U, 14S, 15U, and 16S may have satisfied, but did not conclusively satisfy, the criteria for wetland hydrology.
- Surface-water levels measured by the RDS data logger indicated that inundation occurred to an elevation of about 128.25 m (420.76 ft) for a duration sufficient to satisfy wetland hydrology criteria. The area defined by this elevation was within the area determined to

have wetland hydrology based on ground-water levels.

- From September 1999 to May 2000, surface-water levels were generally 0.1 m to 0.5 m (0.3–1.6 ft) below the normal elevation of 128.0 m (420 ft) as specified in the IDOT Conceptual Wetland and Illinois Chorus Frog Compensation Plan. Since May 2000, surface-water levels have generally been at or above the normal elevation.
- Limitations of the wetland hydrology determination are as follows:
 - The base map is an unrectified aerial photograph.
 - The wetland acreage determination contains pre-existing wetland.

PLANNED FUTURE ACTIVITIES

- A soil-zone monitoring well will be installed at well cluster 4. Additional soil-zone wells will be installed along a north-south trending line anchored on this well cluster. The purpose of these wells will be to better define the shifting boundary between wetland and nonwetland hydrology in the western part of the site.
- GPS will be used to link the well locations surveyed with the total station to a spatial coordinate system.
- Monitoring will continue through the spring of 2003.

Sand Road Wetland Compensation Site (FAP 310)

General Study Area and Vicinity

from the USGS Topographic Series, Wood River, IL-MO 7.5-minute Quadrangle (USGS 1994)

contour interval is 10 feet



Sand Road Wetland Compensation Site (FAP 310)

Estimated Areal Extent of 2000 Wetland Hydrology

based on data collected between September 1, 1999 and September 1, 2000 $\,$

map based on unrectified aerial photography from IDOT (date and frame unknown)





Sand Road Wetland Compensation Site September 1, 1999 to September 1, 2000





Sand Road Wetland Compensation Site September 1, 1999 to September 1, 2000





Sand Road Wetland Compensation Site September 1, 1999 to September 1, 2000










Sand Road Wetland Compensation Site September 1999 through August 2000

Total Monthly Precipitation Recorded On Site and at the Edwardsville, IL Weather Station



on-site rain gauge not deployed for entire month

 \bigtriangleup suspect data: clogged rain collector, represents a minimum value for the month

* see text for explanation

Graph last updated September 15, 2000

ISGS #17

MILAN BELTWAY AIRPORT ROAD WETLAND COMPENSATION SITE FAU 5822 Rock Island County, near Milan, Illinois Primary Project Manager: Keith W. Carr Secondary Project Manager: Steven E. Benton

SITE HISTORY

- July 1996: ISGS submitted an Initial Site Evaluation Report to IDOT.
- February 1997: IDOT issued a task order for a hydrologic characterization of the site.
- August 1997: ISGS data collection was initiated with the installation of monitoring wells and staff gauges.
- August 2000: ISGS sent a letter to IDOT recommending approximate excavation depths required to attain wetland hydrology in the southern third of the site.

WETLAND HYDROLOGY CALCULATION FOR 2000

The area that satisfied wetland hydrology criteria in 2000 is estimated to be 19.6 ac (7.9 ha). The entire site is roughly 25.6 ac (10.4 ha), leaving approximately 6.0 ac (2.4 ha) that did not conclusively satisfy wetland hydrology in 2000. Based upon new scale calculations, the area that satisfied the wetland hydrology criteria in 1999 has been revised from 23 ac (9 ha) to 18.5 ac (7.5 ha). This new scale was derived from surveyed points on IDOT plans of the site and applied to the existing unrectified aerial photo-map. This estimate is based on the following factors.

- The median (1961–1990) length of the growing season, as measured at the Moline Airport Weather Service Office, is 192 days (April 13 to October 25), and 12.5% of the growing season is 24 days.
- In October and November 1999, and in March 2000, precipitation was below the normal range, leading to dry conditions entering the spring of 2000. Precipitation returned to the normal range in April and May 2000, and was slightly above the normal range in June 2000. Total precipitation for the period from September 1999 to July 2000 was 94% of normal. Due to the proximity of the Moline Airport weather station, approximately 2.4 km (1.5 mi) east of the site, no on-site precipitation data are collected at this site.
- In 2000, water levels measured in wells RDS 1, 1S, 2S, 3S, 5S, 6S, 7S, and 8S conclusively satisfied the wetland hydrology criteria in the 1987 U.S. Army Corp of Engineers Wetland Delineation Manual. Water levels measured in wells 4S and 9S also apparently satisfied the wetland hydrology criteria, however, nearby high-resolution data from the RDS units did not support inclusion of these wells in the wetland acreage. Water levels measured in wells RDS 2 and RDS 3, and gauge C may have satisfied the wetland hydrology criteria.
- Starting in April 2000, water levels were measured in Case Creek to investigate the potential of this drainageway as a water source for the site. Analysis of the hydrograph

indicates that if the site were opened to Case Creek during the spring of 2000, the creek would not inundate those parts of the site that are now wetland.

- Limitations of the wetland hydrology determination are as follows:
 - The base map is an unrectified aerial photograph.
 - Well locations on the base map were estimated from landmarks.

PLANNED FUTURE ACTIVITIES

- As discussed in a letter of August 9, 2000, IDOT may excavate the southern third of the site in order to expand the area that conclusively satisfies wetland hydrology criteria. Several wells and RDS units will have to be removed prior to this excavation and re-deployed afterwards.
- All on-site wells and instrument locations will be surveyed via GPS to enhance accuracy in determining the area satisfying wetland hydrology criteria.

Milan Beltway, Airport Road Wetland Compensation Site (FAU 5822)

General Study Area and Vicinity

from the USGS Topographic Series, Milan IL-IA 7.5-minute Quadrangle (USGS 1992) contour interval is 10 feet



Milan Beltway, Airport Road Wetland Compensation Site (FAU 5822)

Estimated Areal Extent of 2000 Wetland Hydrology

based on data collected between September 1, 1999 and September 1, 2000

map based on unrectified aerial photography from IDOT (date and frame number unknown)



2000 wetland hydrology

- □ stage gauge
- △ RDS data logger
- ♦ Global data logger



















Milan Beltway, Airport Road Wetland Compensation Site September 1999 through August 2000

* see text for explanation

Graph last updated September 15, 2000

SALINE COUNTY WETLAND COMPENSATION SITE FAP 331 Saline County, near Harrisburg, Illinois Primary Project Manager: D. Bradley Ketterling Secondary Project Manager: Bonnie J. Robinson

SITE HISTORY

- May 1994: The ISGS began a hydrogeologic characterization of the site.
- June 1995: An interim hydrogeologic characterization report was submitted to IDOT.
- October 1996: An area of the site was excavated as part of the wetland mitigation.
- August 1997: The construction of the berm around the new wetland was completed.
- March 1998: A draft final characterization report was completed.
- March 1999–April 2000: Additional soil-zone monitoring wells were installed in March, 1999 (5), November, 1999 (3), and April 2000 (6). One staff gauge was added in April, 2000.

WETLAND HYDROLOGY CALCULATION FOR 2000

Based on construction plans provided by IDOT, we estimate that the total area that satisfied wetland hydrology criteria in 2000 is 9.9 ac (4.0 ha). Of this amount, approximately 1.7 ac (0.7 ha) were classified as wetland by the INHS prior to site construction. In 1999, 15.5 ac (6.3 ha) met the criteria for wetland hydrology, 1.8 ac (0.7 ha) of which was pre-existing wetland. The figure for 2000 is based on the following factors.

- According to the Midwestern Climate Center, the median length of the growing season at Harrisburg, Illinois is 212 days, starting March 26 and ending October 27. Therefore, 12.5% of the growing season is 26 days.
- Water levels in wells 2U, 3U, 4S, 10U, 11S, 12S, 13S, and 14S were above or within 30 cm (1 ft) of the surface for more than 12.5% of the growing season, thereby satisfying the wetland hydrology criteria outlined in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual.
- The average elevation of the water surface in the excavated area during the period between April 4 and September 1, 2000 was 122.56 m (402.09 ft) NGVD, 1929. This is 9.1 cm (3.6 inches) above the design depth for the open-water area. However, the near-record June rainfall at Harrisburg likely contributed to the high average water level.
- The shallow ground-water surface was mathematically interpolated using a software contouring package and compared to a digitized topographic grading plan map from IDOT having a 0.15 m (0.5 ft) contour interval. The intersections of land-surface and potentiometric-surface contours were plotted, producing a map of the depth to water over

the site. Those areas having a depth less than 30 cm (1 ft) were considered to have met the conditions for wetland hydrology. Because of the dynamic nature of the water-level fluctuations recorded, this approach could not generate a positive calculation but served as a guideline to identify areas of divergent soil moisture.

- Areas of the site that were mapped as pre-existing wetlands were generally considered to have met the criteria for wetland hydrology if the water-level record at nearby wells and gauges met the criteria for wetland hydrology (*e.g.* well 4S and 13S). Furthermore, the data logger in the emergent wetland provided a continuous water-level record that when used in combination with the topographic map can identify the extent and duration of inundation.
- The limitations of the above two methods include:
 - The interpolated ground-water surface is referenced to the Illinois State Plane Coordinate System whereas the topographic map is based on a grading plan with no discernable horizontal reference. Overlaying the two surfaces was accomplished using photo-identifiable points.
 - Mapped land-surface contours are incomplete and/or not extensively labeled on the grading plan.
 - Some inconsistencies were observed between the land-surface elevations at wells measured using a automatic level versus their apparent elevation on the grading plan map.

PLANNED FUTURE ACTIVITIES

- Wells along the northern perimeter show wetland hydrology, yet how far south these
 conditions persist could not be resolved with a great degree of certainty. In the future, more
 frequent, automated data collection will help define this boundary more accurately. Soilmoisture data loggers or transducers will be deployed in monitoring wells and/or remnant
 stream courses, particularly in the northeastern and northwestern quadrants.
- A contour map of the site combined with more frequent data collection would allow more detailed mapping of on-site flooding and wetland hydrology. A request has been placed for any photogrammetrically-derived maps that may have been generated in the past. A land-based survey of the site would be difficult due to the density of the vegetation.
- Monitoring for wetland hydrology will continue at this site through 2003 or until no longer required by IDOT.

Saline County Wetland Compensation Site (FAP 331)

General Study Area and Vicinity

from the USGS Topographic Series, Carrier Mills, IL 7.5-minute Quadrangle (USGS 1996) contour interval is 10 feet



general study area

Saline County Wetland Compensation Site (FAP 331)

Estimated Areal Extent of 2000 Wetland Hydrology

based on data collected between September 1, 1999 and September 1, 2000

map based on unrectified aerial photography from IDOT (1998, NAPP 22-441) and topographic grading plans from IDOT (05/19/1995)













Depth to Water





Saline County Wetland Compensation Site March 1, 2000 to September 1, 2000

Saline County Wetland Compensation Site September 1999 through August 2000

Total Monthly Precipitation Recorded On Site and at the Harrisburg, IL Weather Station



on-site rain gauge not deployed for entire month

* see text for explanation

Graph last updated September 15, 2000

HICKORY GROVE WETLAND COMPENSATION SITE FAP 305 McHenry County, near Cary, Illinois Primary Project Manager: James J. Miner Secondary Project Manager: Christine S. Fucciolo

SITE HISTORY

- Fall 1993: ISGS began to examine the hydrogeology of this site.
- August 1996: ISGS submitted a final hydrogeologic characterization report to IDOT (ISGS Open File Series 1996–7).
- February 1996: IDOT began restoration of the drained wetlands by filling the ditch west of the spring run and removing field tile and woody vegetation.
- Spring 1997: McHenry County Conservation District removed additional field tile, cut down large trees, and filled the remainder of the ditch.

WETLAND HYDROLOGY CALCULATION FOR 2000

We estimate that the total area of created wetland that conclusively satisfied wetland hydrology criteria in 2000 is 3.9 ac (1.6 ha) out of a formerly drained area of 9.4 ac (3.8 ha). This is almost identical to the area delineated in 1999. This estimate is based on the following factors.

- According to the Midwestern Climate Center, the median date that the growing season begins in Barrington is April 24 and the season lasts 178 days; 12.5% of the growing season is 22 days.
- In October and November 1999, and March 2000, precipitation was below the normal range, continuing a dry trend from Summer 1999 and leading to dry conditions during Spring 2000. Precipitation was above the normal range in April, May, and June 2000, resulting in wet conditions later than usual at this site.
- In 2000, water levels measured in the following wells conclusively satisfied the wetland hydrology criteria of the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual: wells 5U, 8U, 17S, 18S, 19S, 21S, 22S, and 23S. Wells 3S and 24S may have satisfied the criteria. This list does not include wells that were installed in parts of the site that satisfied wetland hydrology criteria prior to restoration activities.
- A well potentially affected by the restoration that does not yet satisfy wetland hydrology criteria is 15S, which showed water levels within 15 cm (0.5 ft) of satisfying the criteria. In 1999, water levels were within 10 cm (0.3 ft) of satisfying criteria. Additional rehydration may be possible as soil-forming processes continue to interact with the body of decayed peat, although levels to date do not indicate that restoration will occur within the post-construction monitoring period.

- Limitations of the wetland hydrology determination are as follows:
 - The positions of several wells were estimated rather than surveyed.
 - The water table is poorly defined at the apex of the peat mound where drier areas are found (*e.g.* near well 15S)
 - The area for 2000 was calculated using the following method. The originally drained area was delineated and measured in 1999 using GPS methods, then transferred to an unrectified aerial photo that was used as a figure in the 1999 report, causing a shift in scale. The area for 2000 was calculated by adjusting the figure based on 2000 water levels, then measuring the area using the digital planimeter. The area was then adjusted for the changed scale in the figure by measuring the area of wetland hydrology shown on the 1999 map with the digital planimeter and comparing that to the 1999 GPS calculation of the same area, thus producing a percent difference in scale.

PLANNED FUTURE ACTIVITIES

- Monitoring will continue through Spring 2001.
- Although water levels in small portions of the peat mound are not defined as well as desired, no additional wells are planned for installation. This is due to the small size of the area in question, the impending cessation of activities at the site, and the desire to limit disturbance to the sensitive biota that exist in the preserve.

Hickory Grove Wetland Compensation Site (FAP 305)

General Study Area and Vicinity

from the USGS Topographic Series, Barrington, IL 7.5-minute Quadrangle (USGS 1993)

contour interval is 10 feet



Hickory Grove Wetland Compensation Site (FAP 305)

Estimated Extent of Restored Area Satisfying Wetland Hydrology Criteria in 2000

based on data collected between September 1, 1999 and September 1, 2000

map based on unrectified aerial photography from IDOT (date unknown) and a 1999 GPS survey



Hickory Grove Wetland Compensation Site September 1, 1999 to September 1, 2000



Hickory Grove Wetland Compensation Site September 1, 1999 to September 1, 2000

Depth to Water in Soil-Zone Monitoring Wells



Hickory Grove Wetland Compensation Site September 1, 1999 to September 1, 2000








Depths to Water in Lower Monitoring Wells



Depths to Water in Lower Monitoring Wells (excluding Well 2R)



Hickory Grove Wetland Compensation Site September 1999 through August 2000

Total Monthly Precipitation Recorded On Site and at the Barrington, IL Weather Station



on-site rain gauge not deployed for entire month * see text for explanation

Graph last updated September 15, 2000

VAN PATTEN WOODS WETLAND COMPENSATION SITE FAP 303 Lake County, near Rosecrans, Illinois Primary Project Manager: Christine S. Fucciolo Secondary Project Manager: James J. Miner

SITE HISTORY

- August 1994: ISGS began monitoring ground- and surface-water levels at the site.
- September 1995: IDOT excavated a wetland compensation basin adjacent to the preexisting sedge meadow.
- April 1997: ISGS submitted a final hydrogeologic characterization report to IDOT (ISGS Open File Series 1997–6).
- June 2000: ISGS completed five years of monitoring the compensation basin. The entire created wetland conclusively satisfied the wetland hydrology criteria in all five years of monitoring, specifically 1996 through 2000.

WETLAND HYDROLOGY CALCULATION FOR 2000

We estimate that the entire created wetland conclusively satisfied wetland hydrology criteria in 2000, for a total of 0.64 ac (0.25 ha). This area is identical to the area calculated in 1999. This estimate is based on the following factors.

- According to the Midwestern Climate Center, the median date that the growing season begins in Antioch is April 28 and the season lasts 180 days; 12.5% of the growing season is 23 days.
- Precipitation was below the normal range in October and November 1999, and in March 2000. It was above the normal range in February, April, May, June and July 2000.
- In 2000, water levels measured in all wells located in the compensation area conclusively satisfied the wetland hydrology criteria of the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual, including wells 15S, 16S, 17S, 18S, 19S, and 20S.
- Shallow standing water was present in the northern half of the compensation basin for a few months. This hydropattern is similar to that observed in the adjacent natural sedge meadow.

PLANNED FUTURE ACTIVITIES

- Deeper monitoring wells will be removed or abandoned in Fall 2000. All other wells will be left in place at the request of the Lake County Forest Preserve District.
- A Final Monitoring Report summarizing hydrologic data will be prepared.

Van Patten Woods Wetland Compensation Site (FAP 303)

General Study Area and Vicinity

from the USGS Topographic Series, Wadsworth, IL-WI 7.5-minute Quadrangle (USGS 1993)

contour interval is 10 feet



general study area

Van Patten Woods Wetland Compensation Site (FAP 303)

Estimated Areal Extent of 2000 Wetland Hydrology

based on data collected between September 1, 1999 and September 1, 2000

map based on Wadsworth, IL-WI 7.5-minute Quadrangle and a Lake County Forest Preserve map (date unknown)



Water-Level Elevations in Soil-Zone Monitoring Wells in and near the Wetland Compensation Basin



Depth to Water in Soil-Zone Monitoring Wells in and near the Wetland Compensation Basin



Water-Level Elevations in Upper and Lower Monitoring Wells near the Wetland Compensation Basin



Depth to Water in Upper and Lower Monitoring Wells near the Wetland Compensation Basin







Depth to Water in Soil-Zone Monitoring Wells in the Pre-Existing Sedge Meadow



Water-Level Elevations in Upper and Lower Monitoring Wells in the Pre-Existing Sedge Meadow



Depth to Water in Upper and Lower Monitoring Wells in the Pre-Existing Sedge Meadow



Van Patten Woods Wetland Compensation Site September 1999 through August 2000

Total Monthly Precipitation Recorded On Site and at the Antioch, IL Weather Station



on-site rain gauge not deployed for entire month * see text for explanation

Graph last updated September 15, 2000

JOSLIN WETLAND COMPENSATION SITE FAP 585 Henry County, near Joslin, Illinois Primary Project Manager: Keith W. Carr Secondary Project Manager: Kelli D. Weaver

SITE HISTORY

- January 1995: An initial ISGS topographic survey and hydrologic analysis was sent to IDOT.
- Summer 1998: ISGS installed 18 soil-zone monitoring wells.

WETLAND HYDROLOGY CALCULATION FOR 2000

The area that satisfied the wetland hydrology criteria in 2000 is 14.3 ac (5.8 ha), encompassing the entire former plowed field. Additional acreage outside the plowed field also likely satisfies the criteria, but these areas are outside the site boundaries as shown on IDOT materials. This estimate encompasses the same area as in 1999, although the use of a more accurate base map resulted in the revision of wetland acreage from 18.0 ac (7.3 ha) in 1999. The map used in 2000 is an IDOT site plan for tree plantings on site. The estimate is based on the following factors.

- According to the Midwestern Climate Center, the median date that the growing season begins in Geneseo is April 10 and the season lasts 201 days; 12.5% of the growing season is 25 days.
- In October and November 1999, and in March 2000, precipitation was significantly below the normal range, leading to dry conditions entering the spring of 2000. Precipitation returned to the normal range in April and May 2000 and was above normal in June 2000. However, an accurate on-site total for June 2000 is lacking due to rain gauge inundation by floodwaters. Total precipitation for the period from September 1999 to July 2000 was 92% of normal.
- In 2000, observations of site inundation, water levels measured in all of the wells, as well as data from a nearby stream gauge indicated that the entire compensation area conclusively satisfied the wetland hydrology criteria of the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual.
- Limitations of the wetland hydrology determination are as follows:
 - Observations were used as evidence of inundation when the wells were not accessible due to flooding.
 - The positions of several wells were estimated rather than surveyed.
 - The water-table elevation is undefined outside the former plowed field.
 - An accurate site boundary and well-location map is lacking.

PLANNED FUTURE ACTIVITIES

• Monitoring is expected to continue through 2003 or until no longer required by IDOT.

• All well locations and the site boundary will be surveyed with GPS, to aid in the accuracy of the wetland acreage determination. This may also be complemented with a topographic survey. An accurate boundary of the wetland compensation area will have to be established, or specified, by IDOT prior to these activities.

Joslin Wetland Compensation Site (FAP 585)

General Study Area and Vicinity

from the USGS Topographic Series, Hillsdale, IL 7.5-minute Quadrangle (USGS 1982) contour interval is 10 feet





Joslin Wetland Compensation Site (FAP 585)

Estimated Areal Extent of 2000 Wetland Hydrology

based on data collected between September 1, 1999 and September 1, 2000 map based on unrectified aerial photography from IDOT (April 15, 1988, MH-88 45-563)





estimated areal extent of 2000 wetland hydrology

- soil-zone monitoring wells
- 総 rain gauge
- ♦ USACE gauging station

Joslin Wetland Compensation Site September 1, 1999 to September 1, 2000



Water-Level Elevations

Joslin Wetland Compensation Site September 1, 1999 to September 1, 2000





Joslin Wetland Compensation Site September 1999 through August 2000

Total Monthly Precipitation Recorded On Site and at the Geneseo, IL Weather Station



on-site rain gauge not deployed for entire month

 \vartriangle suspect data: rain gauge was inundated by flood waters, represents a minimum value for the month * see text for explanation

Graph last updated September 15, 2000

ISGS #27

DECATUR, U.S. ROUTE 51 POTENTIAL WETLAND COMPENSATION SITE FAP 322 Macon County, near Elwin, Illinois Primary Project Manager: Blaine A. Watson Secondary Project Manager: James J. Miner

SITE HISTORY

- May 1999: ISGS was tasked to conduct hydrologic monitoring for a Level I mitigation site assessment.
- March 2000: Due to delays in IDOT's construction schedule, ISGS only installed a surfacewater monitoring station (RDS 1) and a rain gauge.
- May 2000: ISGS completed several shallow soil borings to investigate the presence and condition of a shallow confined aquifer across site.
- June 2000: ISGS conducted an on-site meeting with IDOT Central Office and District 5 engineer to present a letter report outlining the soil-boring investigation and other potential water/construction issues identified at site.

WETLAND HYDROLOGY CALCULATION FOR 2000

Given that no construction has taken place and the necessary instrumentation has not been installed, a delineation of the area satisfying wetland hydrology criteria during 2000 is not attempted at this time. However, data recorded by the surface-water data logger has indicated that surface-water elevations at the site can be very flashy and are highly correlated to storm events.

- According to the Midwestern Climate Center, the median date that the growing season begins in Decatur is April 10 and the season lasts 196 days; 12.5% of the growing season is 25 days.
- Precipitation was at or below the normal range during September through December 1999, and in March and April 2000, contributing to an extended dry period between Summer 1999 and May 2000. Precipitation was within the normal range during January, February, May, and July of 2000. Precipitation was above the normal range during June 2000.

PLANNED FUTURE ACTIVITIES

• After construction of the planned wetland in 2001, the monitoring scheme will be expanded. A series of "S" wells will be installed to complement the surface-water data logger for evaluating the status of wetland hydrology across the entire site.

Decatur, U.S. Route 51 Potential Wetland Compensation Site (FAP 322)

General Study Area and Vicinity

from the USGS Topographic Series, Decatur, IL 7.5-minute Quadrangle (USGS 1967; photorevised 1975) contour interval is 10 feet



Decatur, U.S. Route 51 Potential Wetland Compensation Site (FAP 322)

Approximate Locations of ISGS Monitoring Equipment

map based on unrectified aerial photography from IDOT (April 14, 1998, NAPP 26-505)



Decatur, U.S. Route 51 Potential Wetland Compensation Site September 1, 1999 to September 1, 2000

Water-Level Elevation



Decatur, U.S. Route 51 Potential Wetland Compensation Site September 1999 through August 2000

Total Monthly Precipitation Recorded On Site and at the Decatur, IL Weather Station



on-site rain gauge not deployed for entire month * see text for explanation

Graph last updated September 15, 2000

GULFPORT WETLAND COMPENSATION SITE FAP 313 Henderson County, near Gulfport, Illinois Primary Project Manager: Keith W. Carr Secondary Project Manager: Kelli D. Weaver

SITE HISTORY

- September 1994: ISGS submitted an Initial Site Evaluation Report to IDOT.
- Fall 1997: IDOT completed excavation of the wetland basin.
- January 1998: ISGS began surface-water elevation monitoring at the site.
- April 1999: ISGS installed shallow wells for ground-water elevation monitoring at the site.

WETLAND HYDROLOGY CALCULATION FOR 2000

We estimate that the total area of created wetland that conclusively satisfied wetland hydrology criteria in 2000 is 6.8 ac (2.75 ha), as compared to 6.9 ac (2.79 ha) which satisfied the criteria in 1999. The total area of the excavated basin was determined in 1999 to be 9.6 ac (3.89 ha). These estimates are based on the following factors.

- According to the Midwestern Climate Center, the median date that the growing season begins in Burlington, Iowa, is April 7 and the season lasts 206 days; 12.5% of the growing season is 26 days.
- In October and November 1999, and in March 2000, precipitation was below the normal range, leading to dry conditions entering the spring of 2000. Precipitation returned to the normal range in April and May 2000, and was above the normal range in June 2000. Total precipitation for the period from September 1999 to July 2000 was 91% of normal.
- In 2000, water levels measured in wells 3S, 5S, and 6VS conclusively satisfied the wetland hydrology criteria of the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. In addition, surface-water levels measured by the RDS data logger indicated that inundation occurred to an elevation of 157.38 m (516.33 ft) for a duration sufficient to satisfy wetland hydrology criteria. The area determination was therefore based upon a combination of the RDS record and monitoring-well data, which are in general agreement.
- Limitations of the wetland hydrology determination are as follows:
 - The calculation is based on IDOT plans of the proposed wetland basin prior to construction, as no as-built topographic survey of the site has been completed.
 - The positions of several wells were estimated rather than surveyed.

PLANNED FUTURE ACTIVITIES

• Monitoring will continue through January 2003 or until no longer required by IDOT.

• All well and instrument locations will be surveyed via GPS during the next monitoring period. A topographic survey may also be undertaken.

Gulfport Wetland Compensation Site

(FAP 313)

General Study Area and Vicinity

from the USGS Topographic Series, Burlington, IA-IL 7.5-minute Quadrangle (USGS 1964, photorevised 1976) contour interval is 10 feet



general study area

Gulfport Wetland Compensation Site (FAP 313)

Estimated Areal Extent of 2000 Wetland Hydrology

based on data collected between September 1, 1999 and September 1, 2000

map based on pre-construction plans received from IDOT (date unknown)





estimated areal extent of 2000 wetland hydrology

estimated areal extent of IDOT excavation

monitoring wellRDS data logger

rain gauge

Gulfport Wetland Compensition Site September 1, 1999 to September 1, 2000

Water-Level Elevations



Gulfport Wetland Compensition Site September 1, 1999 to September 1, 2000

Depth to Water in Wells



Gulfport Wetland Compensation Site September 1999 through August 2000

Total Monthly Precipitation Recorded On Site and at Radio KBUR Weather Station, Burlington, IA



on-site rain gauge not deployed for entire month * see text for explanation

Graph last updated September 15, 2000
ISGS #30

SPRING CREEK POTENTIAL WETLAND BANKING SITE FAP 340 Will County, near New Lenox, Illinois Primary Project Manager: Steven E. Benton Secondary Project Manager: Blaine A. Watson

SITE HISTORY

- January 1995: An access agreement to install monitoring wells in right-of-way along Gouger Road was agreed to by the New Lenox Township Highway Commission.
- October 1995: The ISGS began an investigation of surface- and ground-water levels in the valley of Spring Creek with the installation of monitoring wells and staff gauges along Gouger Road.
- January 1998: The results of the investigation were reported by letter to IDOT.
- March 2000: IDOT requested that monthly data collection be suspended.

SUMMARY OF 2000 EVENTS

- Ground-water and surface-water levels were collected up to February 2000.
- Ground-water levels were generally greater than 2 meters (6.6 ft) below ground surface.
- Precipitation in October 1999, November 1999, and March 2000 were below the normal range as part of a dry period that began in Summer 1999.

PLANNED FUTURE ACTIVITIES

• Currently, no data are being collected at this site. Resumption of data collection and implementation of a Level II Assessment depends on the outcome of a feasibility study being conducted by IDOT District 1.

Spring Creek Potential Wetland Banking Site (FAP 340)

General Study Area and Vicinity

from the USGS Topographic Series, Joliet, IL 7.5-minute Quadrangle (USGS 1993)

contour interval is 10 feet



general study area

Spring Creek Potential Wetland Banking Site (FAP 340)

Approximate Locations of ISGS Monitoring Wells and Stage Gauges

map based on Joliet, IL 7.5-minute Quadrangle (USGS 1993)



stage gauge

general study area

Spring Creek Potential Wetland Banking Site September 1, 1999 to September 1, 2000



Water-Level Elevations

Spring Creek Potential Wetland Banking Site September 1, 1999 to September 1, 2000



Depth to Water

Spring Creek Potential Wetland Banking Site September 1999 through August 2000

Total Monthly Precipitation Recorded at the Joliet, IL Weather Station

(no rain gauge deployed on site)



* see text for explanation

Graph last updated September 15, 2000

NORTH CHICAGO POTENTIAL WETLAND BANKING SITE FAP 120 Lake County, near North Chicago, Illinois Primary Project Manager: James J. Miner Secondary Project Manager: Keith W. Carr

SITE HISTORY

- Spring 1995: ISGS submitted an Initial Site Evaluation Report to IDOT.
- Summer and Fall 1998: ISGS installed monitoring wells and surface-water data loggers, and began a geochemical characterization.
- January 2000: A letter report containing initial observations and recommendations was transmitted to IDOT.

WETLAND HYDROLOGY CALCULATION FOR 2000 AND SUMMARY OF 2000 EVENTS

Because this site is a potential compensation site, an estimate of areas of wetland hydrology is not required. Wetlands on site have been mapped by INHS and Christopher B. Burke Engineering, Ltd., and ISGS activities have been concentrated on an examination of hydrogeology and geochemistry of the site.

- According to the Midwestern Climate Center, the median date that the growing season begins in Waukegan is April 14 and the season lasts 195 days; 12.5% of the growing season is 24 days.
- In 2000, precipitation was below the normal range in October and November 1999 and March 2000 as part of a generally dry trend that began in Summer 1999. Precipitation was above the normal range in April through July 2000, leading to wet conditions later than usual.
- In 2000, surface-water levels were measured at 8 locations within the site.
- Ground-water elevations were measured in two different wetlands within the site and in two transects across the site.

ADDITIONAL INFORMATION

- No aquifers have been identified that may supply sufficient ground water to any potential wetland compensation area. Surface water is likely the primary source for any wetland compensation activities. Clay-rich sediments will likely perch surface water in an efficient manner.
- The berm located on the east side of the site is being breached at outlet O-3 by surface water during spring, and erosion may cut completely through the berm and dewater wetlands that rely on the berm to produce flooding.

• High levels of chloride, silt, and other anthropogenic additions are noted in inputs on the north and west sides of the site. Therefore, it may be useful to create settling ponds and/or treatment wetlands adjacent to each inlet where impacts were found.

PLANNED FUTURE ACTIVITIES

- Shallow wells are to be installed in areas of hydric soils when soil mapping becomes available from Christopher B. Burke Engineering, Ltd.
- Water-level monitoring will continue until no longer required by IDOT.

North Chicago Potential Wetland Banking Site (FAP 120)

General Study Area and Vicinity

from the USGS Topographic Series, Libertyville, IL (W) (USGS 1993) and Waukegan, IL (E) (USGS 1993) 7.5-minute Quadrangles



North Chicago Potential Wetland Banking Site

(FAP 120)

Approximate Locations of ISGS Monitoring Instruments

map based on aerial photography from IDOT (April 17, 1993, ST 9 587)



- monitoring well(s)
- O# outlet number
- **I#** inlet number
- \triangle RDS data logger
- $\mathcal{E}_{L}^{\mathbb{N}}$ rain gauge
- ---> surface-water flow direction

Water-Level Elevations





Depth to Water

Water-Level Elevations





Depth to Water



Water-Level Elevations



Depth to Water

Water-Level Elevations in RDS Data Loggers



North Chicago Potential Wetland Banking Site September 1999 through August 2000

Total Monthly Precipitation Recorded On Site and at the Waukegan, IL Weather Station



on-site rain gauge not deployed for the entire month * see text for explanation

Graph last updated September 15, 2000

YORKVILLE FENS GROUND-WATER MONITORING SITE FAP 29/860 Kendall County, near Yorkville, Illinois Primary Project Manager: James J. Miner Secondary Project Manager: D. Bradley Ketterling

SITE HISTORY

- Fall 1997: ISGS installed monitoring wells at the site.
- June 1999: A letter was sent to IDOT summarizing the potential hydrogeologic impacts to the fens caused by various aspects of proposed sewer construction.
- June 2000: IDOT requested that all activities cease at the site and all instruments be removed.

WETLAND HYDROLOGY CALCULATION FOR 2000

Because this site is not a potential wetland compensation site, a calculation of areas meeting wetland hydrology criteria is not needed.

- According to the Midwestern Climate Center, the median date that the growing season begins in Aurora is April 10 and the season lasts 194 days; 12.5% of the growing season is 24 days.
- In October and November 1999 and March 2000, precipitation was below the normal range as part of a dry trend that began in Summer 1999. Precipitation was above the normal range in April and June 2000 as part of a wetter trend in late Spring and Summer 2000.
- In 2000, water levels measured in the following wells conclusively satisfied the wetland hydrology criteria of the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual: wells 2S and 4S. These wells are located respectively in the seep zone of the upper and lower seep zones that are located on the bluff face.
- All water levels are reported relative to a benchmark set at an arbitrary elevation on site.

PLANNED FUTURE ACTIVITIES

• All monitoring instruments are projected to be removed in Fall 2000.

Yorkville Fens Ground-Water Monitoring Site (FAP 29/860)

General Study Area and Vicinity

from the USGS Topographic Series, Yorkville, IL 7.5-minute Quadrangle (USGS 1993)

contour interval is 10 feet



general study area

Yorkville Fens Ground-Water Monitoring Site (FAP 29/860)

Approximate Locations of ISGS Monitoring Wells

map based on unrectified aerial photography from IDOT (April 03, 1994, WL-1711 ST 9 185)



Yorkville Fens Ground-Water Monitoring Site September 1, 1999 through September 1, 2000



Relative Water-Level Elevations

Yorkville Fens Ground-Water Monitoring Site September 1, 1999 through September 1, 2000



Depth to Water in Wells

Yorkville Fens Ground-Water Monitoring Site September 1999 through August 2000

Total Monthly Precipitation Recorded at the Aurora, IL Weather Station

(no rain gauge deployed on site)



* see text for explanation

Graph last updated September 15, 2000

JAYCEE PARK GROUND-WATER MONITORING SITE McHenry County, near Cary, Illinois Primary Project Manager: Steven E. Benton Secondary Project Manager: Michael V. Miller

SITE HISTORY

- January 1996: IDOT issued a task order to the ISGS to investigate declining water levels in Cary Pond.
- March 1996: The investigation was started with the installation of monitoring wells near the pond and U.S. Route 14.
- April 1996: The results of the investigation were reported to IDOT by letter. The letter recommended expanding the area under investigation.
- August 1996: Additional ground-water monitoring wells, staff gauges, and electronic waterlevel and flow meters were installed as part of an expanded investigation.
- February 1998: The initial results of the expanded investigation were reported to IDOT District 1 and the Cary Park District by letter.
- December 1999: The final results of the expanded investigation were reported to IDOT Central Office, IDOT District 1, and Cary Park District by letter.

SUMMARY OF 2000 EVENTS

- March 2000: A meeting was held with IDOT District 1 and the Cary Park District to discuss the final results of the investigation and future site activities. It was decided to continue monitoring surface- and ground-water levels through June 2000.
- During the monitoring period (September 1999–June 2000), precipitation was below the normal range in October and November 1999 as part of a dry period that began in Summer 1999. Precipitation in April, May, and June 2000 was at or above the normal range.
- Surface-water levels in Cary Pond were lower than in 1999, but higher than in 1998, 1997, and 1996. Lower levels were probably due to the dry period that began in Summer 1999.
- Data collection was terminated June 15, 2000.

PLANNED FUTURE ACTIVITIES

• The Cary Park District intends to continue collecting ground-water levels in a number of the monitoring wells. Those wells which they choose not to monitor will be abandoned by the ISGS.

Jaycee Park Ground-Water Monitoring Site General Study Area and Vicinity

from the USGS Topographic Series, Crystal Lake, IL (W) (USGS 1992) and Barrington, IL (E) (USGS 1993) 7.5-minute Quadrangles contour interval is 10 feet



general study area

Jaycee Park Ground-Water Monitoring Site

Ground-Water and Surface-Water Gauging Locations



from the USGS Topographic Series, Crystal Lake, IL (W) (USGS 1992) and Barrington, IL (E) (USGS 1993) 7.5 minute Quadrangles

Jaycee Park Ground-Water Monitoring Site 1997 to 2000



Water-Level Elevation of Jaycee Park Pond

Jaycee Park Ground-Water Monitoring Site September 1999 through August 2000

Total Monthly Precipitation Recorded On Site and at the Barrington, IL Weather Station



on-site rain gauge not deployed for entire month * see text for explanation

Graph last updated September 15, 2000

ISGS #42

HANCOCK COUNTY NEAR CARTHAGE POTENTIAL WETLAND COMPENSATION SITE FAP 315 & 10 Hancock County, near Carthage, Illinois Project Manager: Blaine A. Watson Secondary Project Manager: James J. Miner

SITE HISTORY

- December 1996: ISGS wrote a letter to IDOT requesting a determination of the farmed wetland status of the site.
- October 1997: IDOT obtained landowner permission for the ISGS to begin work.
- February 1998: ISGS installed monitoring wells and began a hydrogeologic characterization of the site.
- September 1999: ISGS installed a surface-water data logger (Infinities sonic) to record stage fluctuations of the La Moine River.
- March 2000: ISGS installed a surface-water monitoring station (RDS 1).
- May 2000: ISGS collected GPS data on locations of all site instruments.
- August 2000: ISGS presented a summary of hydrologic data gathered to-date and participated in general site discussion at a planning meeting with IDOT and Christopher B. Burke Engineering, Ltd. The meeting included discussion of wetland design concerns and construction ideas for the final compensation plan at the site.

WETLAND HYDROLOGY CALCULATION FOR 2000

We estimate that the total area of the site that conclusively satisfied wetland hydrology criteria in 2000 is 8.5 ac (3.4 ha) out of an area of 40 ac (16.2 ha). By comparison, the area of wetland hydrology in 1999 was approximately 30 ac (12.2 ha). Decreased precipitation and lower ground-water levels are thought to be the primary contributors to the decrease in the area of wetland hydrology during the current year. This year's estimate is based on the following factors.

- According to the Midwestern Climate Center, the median date that the growing season begins in La Harpe is April 11 and the season lasts 192 days; 12.5% of the growing season is 24 days.
- Precipitation in 1999 was within or above the normal range during September and December. Although questionable on-site data were collected during October and November 1999, data from the nearby weather station data indicated precipitation was below the normal range. An overall pattern of precipitation amounts being below the normal range between October 1999 and May 2000 is evident. Precipitation was within the normal range to above the normal range for January, February, June, and July 2000. August 2000 precipitation was below the normal range.

- The surface-water data logger indicated inundation to an elevation of 165.3 m (542.7 ft) for a duration sufficient to satisfy wetland hydrology criteria in certain wells.
- In 2000, water levels measured in the following wells conclusively satisfied the wetland hydrology criteria of the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual: wells 1U, 4U, 6U, 8U. Water levels in wells 2U and 3U may have satisfied the wetland hydrology criteria, but did not do so conclusively.
- Limitations of the wetland hydrology determination are as follows:
 - The required wetland hydrology of some wells was based on an extended period during which standing surface water was confirmed by the on-site surface-water data logger. The surface-water elevations were compared relative to land-surface elevations at the wells to make this determination.
 - Ground-surface elevations of the wells were resurveyed in Spring 2000 and the GPS coordinates of all instruments were determined during May 2000. However, the aerial photograph used as a base for the figure has not been rectified or georeferenced. Therefore, the positions of instrument and photo-identification points determined via GPS were plotted at the same approximate scale as the aerial photograph and were then overlain on the aerial photograph based on best-fit visual reference to known photo-identification points.
 - A topographic map of the site with a 0.30 m (1 ft) contour interval is required to more accurately determine wetland hydrology status in areas of inundation.

PLANNED FUTURE ACTIVITIES

• Additional "S" wells will be installed to better define water levels in the west-central, northern, and eastern portions of the site.

Hancock County near Carthage Potential Wetland Compensation Site (FAP 315 and FAP 10)

General Study Area and Vicinity

from the USGS Topographic Series, Carthage East, IL 7.5-minute Quadrangle (USGS 1974) contour interval is 10 feet



Hancock County near Carthage Potential Wetland Compensation Site (FAP 315 and FAP 10)

Estimated Areal Extent of 2000 Wetland Hydrology

based on data collected between September 1, 1999 and September 1, 2000

map based on unrectified aerial photography from IDOT (NAPP 59-527, 03/16/94



Hancock County near Carthage Potential Wetland Compensation Site September 1, 1999 to September 1, 2000





Hancock County near Carthage Potential Wetland Compensation Site September 1, 1999 to September 1, 2000



Depth to Water

Hancock County near Carthage Potential Wetland Compensation Site September 1, 1999 to September 1, 2000

168.0 167.5 167.0 166.5 Elevation (in m referenced to NGVD, 1929) 166.0 — Well 1M -D-Well 1L 165.5 - Well 2M –**∆**– Well 2L 165.0 -X-Well 3M 164.5 —●— Well 4M 164.0 -O-Well 4L -X Well 6M 163.5 -**X**- Well 6L п 163.0 -+- Well 7M 162.5 162.0 161.5 161.0 160.5 160.0 Mar 2000 Apr 2000 May 2000 Jul 2000 Sep 2000 Sep 1999 Oct 1999 Nov 1999 Dec 1999 Jan 2000 Feb 2000 Jun 2000 Aug 2000

Water-Level Elevations in Deeper Monitoring Wells
Hancock County near Carthage Potential Wetland Compensation Site September 1, 1999 to September 1, 2000

Depth to Water in Deeper Monitoring Wells



Hancock County near Carthage Potential Wetland Compensation Site September 1999 through August 2000

Total Monthly Precipitation Recorded On Site and at the Bentley, IL Weather Station



on-site rain gauge not deployed for entire month

 \triangle suspect data: rain gauge malfunction, represents a minimum value for the month

* see text for explanation

Graph last updated September 15, 2000

ECKMANN AND BISCHOFF PROPERTIES POTENTIAL WETLAND COMPENSATION SITE FAP 14 Madison County, near Collinsville, Illinois Primary Project Manager: D. Bradley Ketterling Secondary Project Manager: Steven E. Benton

SITE HISTORY

- November 1994: The ISGS submitted an Initial Site Evaluation Report to IDOT.
- February and March 1997: A hydrogeologic characterization of the site was initiated with the installation of monitoring wells and staff gauges.
- October 1998: A draft characterization report was submitted to IDOT.
- October and November 1999: Damaged wells and staff gauges were replaced.
- April and July 2000: Four soil-zone monitoring wells were installed in the Eckmann property and seven soil-zone monitoring wells were installed in the Bischoff property.

WETLAND HYDROLOGY CALCULATION FOR 2000

Based a digital topographic map provided by IDOT from aerial photography flown February 25, 1997, and well coordinates derived via GPS, the total area that satisfied wetland hydrology criteria in 2000 is 32.7 ac (13.2 ha). This acreage is contained within the Eckmann property alone. In 1999, 39 ac (16 ha) of the Eckmann property met the criteria for wetland hydrology. The figure for 2000 is based on the following factors.

- According to the Midwestern Climate Center, the median length of the growing season at Belleville, Illinois is 203 days, starting April 5 and ending October 24. Therefore, 12.5% of the growing season is 25 days.
- In the first four months of 2000, only the month of February had precipitation at or abovenormal levels at the Belleville SIU research station. Regardless of the lack of rainfall in early 2000, a major rain event on February 18 (2.55 inches at Belleville) caused a steep rise in shallow ground-water levels and flooded the site to a level that fluctuated little for the following two months.
- All of the Eckmann property except for some areas in the northwest and southwest corners conclusively met the criteria for wetland hydrology as outlined in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. Wells in the northwest and southwest corners showed saturation within 30 cm (1 ft) of the surface for 7.9% of the growing season. This length of time may meet but does not conclusively meet the criteria for wetland hydrology.
- The acreage satisfying wetland hydrology criteria within the Bischoff property could not be determined conclusively because the wells there were installed midway into the growing season (July, 2000). However, the probable extent of wetland hydrology is indicated on the

map provided.

PLANNED FUTURE ACTIVITIES

- A Level II Final Report is currently being drafted for submission to IDOT.
- Additional surface-water monitoring stations may be deployed in Schneider Ditch near gauge J or just before the ditch enters the east wetland to help resolve the relative contributions of ditch discharge and precipitation.
- Deeper, "L-wells" may be installed on the Bischoff property to evaluate the vertical gradient in ground-water flow.

Eckmann and Bischoff Properties Potential Wetland Compensation Site (FAP 14)

Study Area and Vicinity

from the USGS Topographic Series, Monks Mound IL 7.5-minute Quadrangle (USGS 1954, photorevised 1993) contour interval is 10 feet



Eckmann and Bischoff Properties Potential Wetland Compensation Site (FAP 14)

Estimated Areal Extent of 2000 Wetland Hydrology

based on data collected between September 1, 1999 and September 1, 2000 map based on unrectified aerial photography from IDOT (date and frame number unknown) and a topographic map from IDOT (aerial photography flown 02/25/1997)



Topographic contours were derived from photogrammetric analysis of aerial photos and were produced by IDOT. This placement of this topographic overlay on the aerial photograph is considered approximate and for presentation purposes only.





Depth to Water in Soil-Zone Monitoring Wells



Depth to Water in Upper Monitoring Wells





Depth to Water in Lower Monitoring Wells





On-site Precipitation and Water Level at RDS Logger in Center of Site



Eckmann and Bischoff Properties Potential Wetland Compensation Site September 1999 through August 2000

Total Monthly Precipitation Recorded On Site and at the SIU Weather Station, Belleville, IL



on-site rain gauge not deployed for entire month

 \bigtriangleup suspect data: rain gauge malfunction, represents a minimum value for the month * see text for explanation

Graph last updated September 15, 2000

PERRY COUNTY POTENTIAL WETLAND COMPENSATION SITE FAS 864 Perry County, near Pinckneyville, Illinois Primary Project Manager: D. Bradley Ketterling Secondary Project Manager: Bonnie J. Robinson

SITE HISTORY

- Winter 1998–1999: Monitoring wells were installed above and adjacent to the longwall mining panels prior to impending mining. Locations were chosen by the Illinois Natural History Survey (INHS) to coincide with soil test plots. Mining and subsidence occurred during 1999, so that preexisting conditions could not be fully documented.
- April 1999: The INHS observed that two ponds had been created by mine subsidence. One and one half panels were subsided in 1999 prior to the end of mining.

WETLAND HYDROLOGY CALCULATION FOR 2000

Because the INHS has requested that the ISGS monitor specific points rather than areas, it is not possible to determine areas of wetland hydrology. However, wells that satisfy wetland hydrology criteria are listed below.

- According to the Midwestern Climate Center, the median length of the growing season at Du Quoin, Illinois is 214 days, starting April 2 and ending November 27. Therefore 12.5% of the growing season is 27 days.
- Precipitation in September and November 1999 was below the normal range as part of a dry period that extended through to April, 2000. After April, more appreciable precipitation was recorded. Total monthly precipitation for June was well above the normal range at 8.70 inches.
- Wells 1S and 2S, in what is referred to as "Depression #1" in Wilm *et al.* (1999), conclusively satisfied the criteria for wetland hydrology as outlined in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. Well 3S, installed outside of the area of anticipated subsidence, did not manifest wetland hydrology.

PLANNED FUTURE ACTIVITIES

- As longwall mining has ceased in the area, the possibility of monitoring other potential wetland sites created by mine subsidence will not be realized. One and one half of a planned total of five panels were dropped.
- Additional soil-zone monitoring wells will be installed at the current project site to determine if the two subsided areas (Depression #1 and #2) achieve wetland hydrology. All wells will be surveyed to a common datum plane so that water-level elevations can be calculated. Well locations and a delineation of the subsided panels will be determined using GPS. More detailed site reconnaissance and/or topographic surveying will be attempted.

Perry County Wetland Compensation Site

(FAS 864)

General Study Area and Vicinity

from the USGS Topographic Series, Pinckneyville, IL 7.5-minute Quadrangle (USGS 1981) contour interval is 10 feet



general study area

Perry County Wetland Compensation Site (FAS 864)

Approximate Locations of ISGS Monitoring Wells

map based on unrectified aerial photography from "Arch of Illinois" mining company (date and frame no. unknown)





Perry County Wetland Compensation Site September 1, 1999 to September 1, 2000





Perry County Wetland Compensation Site September 1999 through August 2000



Total Monthly Precipitation at the DuQuoin, IL Weather Station

* see text for explanation

Graph last updated September 15, 2000

GALENA RIVER BRIDGE WETLAND COMPENSATION SITE Jo Davies County, near Galena, Illinois Primary Project Manager: Keith W. Carr Secondary Project Manager: Kelli D. Weaver

SITE HISTORY

• Spring and Fall 1999: ISGS began monitoring surface- and ground-water at the site.

WETLAND HYDROLOGY CALCULATION FOR 2000

We estimate that the total area of created wetland that conclusively satisfied wetland hydrology criteria in 2000 is 4.5 ac (1.8 ha). This estimate is based on the following factors.

- According to the Midwestern Climate Center, the median date that the growing season begins in Dubuque, Iowa, is April 16 and the season lasts 183 days; 12.5% of the growing season is 23 days.
- From September through December 1999 and in March 2000, precipitation was below the normal range, leading to dry conditions entering the spring of 2000. Precipitation returned to the normal range in April and May 2000, and was above the normal range in June 2000. Total precipitation for the period from September 1999 to July 2000 was 80% of normal.
- In 2000, water levels measured in wells 4S, 5S, 6S, 7S, 8S, 9S, 10S, and 12S conclusively satisfied the wetland hydrology criteria in the 1987 U.S. Army Corp of Engineers Wetland Delineation Manual. Wells 1S and 2S satisfied the wetland hydrology criteria based upon observations of inundation. Water levels measured at the RDS may have satisfied the wetland hydrology criteria.
- Limitations of the wetland hydrology determination are as follows:
 - Some wells on site (*e.g.* 1S and 2S) seem to respond slowly, or not at all, to surface- water inundation, likely due to impermeable parent material exposed at surface during site excavation. As a result, the determinations of wetland hydrology near these wells was augmented with observations of surface-water ponding.
 - At various times during the year, water levels may have been artificially drawn down for some purpose by the site managers.
 - During the spring of 2000, drainage alterations were undertaken at the north end of the site, the hydrologic implications of which remain to be determined.

PLANNED FUTURE ACTIVITIES

- The RDS logger installed to monitor surface water will be moved to a more representative (central) area of the site. A second RDS will be installed to monitor shallow ground-water.
- A flat platform will be installed under the Infinities sonic data logger to provide a consistent reflective surface for dry periods and to discourage vegetation interference with the sensing beam.

- Two low-performing wells on the site will be investigated to determine if an alternative well construction strategy or instrumentation solution would better suit these areas. This may include the installation of two "VS" (very shallow) monitoring wells.
- Monitoring will continue through Spring 2004 or until no longer required by IDOT.

Galena River Bridge Wetland Compensation Site (FAS Route 67)

General Study Area and Vicinity

from the USGS Topographic Series, Galena, IL-Iowa 7.5 minute Quadrangle (USGS 1988)

contour interval is 10 feet



Galena River Bridge Wetland Compensation Site (FAS Route 67) Estimated Areal Extent of 2000 Wetland Hydrology based on data collected between September 1, 1999 and September 1, 2000 map based on 1999 ISGS elevation survey referenced to NGVD, 1929 contour interval is 0.1 meters Easting (ft, floating grid) -900 -850 -800 -750 -700 -650 -600 -550 -500 -450 -400 -350 -300 -250 -200 -150 -100 50 100 -50 0 **8**S + 35 (+) E 82 9S. 25 105 11S 183.0 183 5S 183.2 64S 182.8 $(\mathbf{+})$ 183.0 Ν 12S

6S

-50-

0-

50-

100-

150-

200-

250-

300-

350-

400-

450-

500-

550-

600-

650-

700-

Northing (ft, floating grid)

estimated areal extent of 2000 wetland hydrology **ISGS** elevation survey boundary elevation contour (interval is 0.1 meters) XYZ survey point RDS data logger monitoring well Infinities sonic data logger and rain gauge



Galena River Bridge Wetland Compensation Site September 1, 1999 to September 1, 2000



Water-Level Elevations

Galena River Bridge Wetland Compensation Site September 1, 1999 to September 1, 2000



Depth to Water

Galena River Bridge Wetland Compensation Site September 1999 through August 2000





on-site rain gauge not deployed for entire month

 \triangle suspect data: possible snowfall, represents a minimum value for the month

* see text for explanation

Graph last updated September 15, 2000

ALEXANDER COUNTY, CAPE GIRARDEAU BRIDGE WETLAND COMPENSATION SITE FAP 312 Alexander County, near East Cape Girardeau, Illinois

Primary Project Manager: D. Bradley Ketterling Secondary Project Manager: Bonnie J. Robinson

SITE HISTORY

- August 1998: The ISGS installed monitoring wells.
- November 1999: Wells damaged during flooding in the summer of 1999 were removed and replaced with new monitoring wells. A transducer was added to the southern excavation.
- February 2000: A rain gauge was installed on site.
- August 2000: A topographic survey (arbitrary grid) was conducted using a total station.

WETLAND HYDROLOGY CALCULATION FOR 2000

Based on a topographic map produced by the ISGS, we estimate that no part of the site conclusively achieved wetland hydrology in 2000. In 1999, the entire site, 18 ac (7.3 ha), met the criteria for wetland hydrology. The determination for 2000 is based on the following factors.

- According to the Midwestern Climate Center, the median length of the growing season in Cape Girardeau, Missouri is 223 days, beginning March 26 and ending November 5. Therefore, 12.5% of the growing season is 28 days.
- After a dry summer and fall in 1999, precipitation at Cape Girardeau from December 1999 through February 2000 was above the normal range. A generally dry spring and summer followed, with precipitation above the normal range in June alone.
- Based on the transducer record from well 13S and stage data from the USACE gauge at Cape Girardeau, the site was entirely flooded from June 26 to July 3, 2000, or roughly 7 days. Stage in the Mississippi River dropped below the lowest point of the site on July 8.
- All wells except for those outside the excavations (*e.g.* 1SR, 3S, 4SR, 6SR, 7SR, 8S) had water levels above or within 30 cm (1 ft) below ground surface for 14 consecutive days, or 6.3% of the growing season. This length of time may satisfy but does not conclusively satisfy the criteria for wetland hydrology as outlined in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual.
- The only areas of the site that may have conclusively achieved wetland hydrology are the deepest parts of the excavations with elevations less than 101.2 m (332 ft) NGVD, 1929. These areas represent approximately 0.2 ac (0.08 ha). However, insufficient data exist to determine whether these areas did qualify in 2000. Additional instrumentation or modifications to the existing deployments will better resolve this issue in the future.

ADDITIONAL OBSERVATIONS:

• A considerable amount of sediment deposition has occurred on site due to the extreme flooding in 1999 and to a lesser extent in 2000. A comparison between the construction blueprints and an August 2000 topographic survey determined that the original excavations, which were to act as emergent wetlands, have filled anywhere from 15 to 61 cm (0.5–2 ft) or more. The excavations were to be constructed with their lowest point at or just below 100.6 m (330 ft) NGVD, 1929. At present, no amount of acreage exists at or below that elevation.

PLANNED FUTURE ACTIVITIES

- A pressure transducer will be installed in well 9S or in a new adjacent well, as well as one screened at surface to catch precipitation ponding and other brief flooding events. Water levels in well 9S versus those on the adjacent staff gauge can vary considerably, suggesting slower percolation of surface water than originally anticipated.
- The deployment of the transducer in well 13S will be modified so that it is less susceptible to overtopping by flood waters.
- A more extensive survey of both excavations may be required. Flooding in 1999 and 2000 has changed the original configuration of the site, scouring some areas and depositing considerable amounts of silt in other areas.
- Monitoring will continue through August 2003 or until no longer required by IDOT.

Alexander County, Cape Girardeau Bridge Wetland Compensation Site (FAP 312)

General Study Area and Vicinity

from the USGS Topographic Series, Cape Girardeau, MO-IL and Mc Clure, IL-MO (USGS 1993) contour interval is 10 feet



Alexander County, Cape Girardeau Bridge Wetland Compensation Site (FAP 312)



Locations of ISGS Monitoring Wells and Stage Gauges

map based on a topographic survey conducted by the ISGS, August 8, 2000

This topographic map of the Alexander County wetland compensation site was interpolated using 122 elevations surveyed by the ISGS on 08/08/00. The contours are mapped on an arbitrary grid oriented roughly north-south. The location of well 8S could not be determined during the survey due to line-of-sight obstructions and is therefore approximate.

Alexander County, Cape Girardeau Bridge Wetland Compensation Site September 1, 1999 to September 1, 2000



Alexander County, Cape Girardeau Bridge Wetland Compensation Site September 1, 1999 to September 1, 2000

Depth to Water in Soil-Zone Monitoring Wells replacement (R) wells and 12S installed on November 1, 1999



Alexander County, Cape Girardeau Bridge Wetland Compensation Site September 1, 1999 through September 1, 2000

Stage of the Mississippi River and On-Site Flooding



Alexander County, Cape Girardeau Bridge Wetland Compensation Site September 1999 through August 2000

Total Monthly Precipitation Recorded On Site and at the Regional Airport Weather Station, Cape Girardeau, MO



on-site rain gauge not deployed for the entire month

 \triangle suspect data: rain gauge malfunction, represents a minimum value for the month

* see text for explanation

Graph last updated September 15, 2000

SUGAR CREEK, CLINTON COUNTY WETLAND COMPENSATION SITE FAS 783 Clinton County, near Damiansville, Illinois Primary Project Manager: D. Bradley Ketterling Secondary Project Manager: Bonnie J. Robinson

SITE HISTORY

- Fall 1998: The ISGS began water-level monitoring.
- April 1999: Two additional monitoring wells were installed.
- April 2000: An Infinities sonic data logger was installed on the bridge over Sugar Creek and a rain gauge was installed on site.

WETLAND HYDROLOGY CALCULATION FOR 2000

We estimate that the entire site, approximately 7.9 ac (3.2 ha), conclusively satisfied the criteria for wetland hydrology. The entire site met the criteria in 1999 as well. The figure for 2000 is based on the following factors.

- According to the Midwestern Climate Center, the median length of the growing season at Belleville, Illinois is 202 days, starting April 5 and ending October 24. Therefore, 12.5% of the growing season is 25 days.
- Precipitation in September and November 1999 and March 2000 was below the normal range as part of a relatively dry period that extended from summer 1999 through April 2000. However, rainfall from May to July 2000 was above the normal range. The site received 10.21 inches of rainfall during the month of June. At the Belleville SIU Research Station, precipitation in June was the second-highest monthly total on record.
- In 2000, the water levels in all wells satisfied the criteria for wetland hydrology as outlined in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual. Wells 1S and 4S showed wetland hydrology before the onset of spring flooding. Two flood events in June reached levels capable of flooding the entire site. Three additional flood events in July and August were more than adequate to ensure that all wells satisfied the wetland hydrology criteria.
- Limitations of the wetland hydrology determination are as follows:
 - The calculation was based on survey plats provided by IDOT.

PLANNED FUTURE ACTIVITIES

- A topographic survey of the site will be conducted using a total station.
- A data logger will be installed in the center of the site in a soil-zone monitoring well to
measure the timing and duration of on-site flooding and infiltration.

• Monitoring will continue until Fall 2003 or until no longer required by IDOT.

Sugar Creek, Clinton County Wetland Compensation Site (FAS 783)

General Study Area and Vicinity

from the USGS Topographic Series, Trenton, IL 7.5-minute Quadrangle (USGS 1981) contour interval is 10 feet





Sugar Creek, Clinton County Wetland Compensation Site (FAS 783)

Estimated Areal Extent of 2000 Wetland Hydrology

based on data collected between September 1, 1999 and September 1, 2000

map based on plat of mitigation, Clinton County, IL produced by Henry, Meisenheimer & Gende, Inc. Consulting Engineers



wetland hydrology

- ✤ rain gauge
- Infinities sonic data logger (gauge C)

Sugar Creek, Clinton County Wetland Compensation Site September 1, 1999 to September 1, 2000



Water-Level Elevations

Sugar Creek, Clinton County Wetland Compensation Site September 1, 1999 to September 1, 2000



Depth to Water

Sugar Creek, Clinton County Wetland Compensation Site September 1, 1999 to September 1, 2000

Stage in Sugar Creek at County Highway 8



Sugar Creek, Clinton County Wetland Compensation Site May 15, 2000 to September 1, 2000

Stage in Sugar Creek at County Highway 8



Sugar Creek, Clinton County Wetland Compensation Site September 1999 through August 2000





on-site rain gauge not deployed for entire month * see text for explanation

Graph last updated September 15, 2000

MORRIS ILLINOIS RIVER POTENTIAL WETLAND BANKING SITE Grundy County, near Morris, Illinois Primary Project Manager: Keith W. Carr Secondary Project Manager: James J. Miner

SITE HISTORY

- March 1999: ISGS was tasked by IDOT to perform a Level II hydrogeologic assessment of the potential banking site.
- August 1999: ISGS began monitoring ground- and surface-water levels at the site.
- May 2000: GPS-derived locations of all monitoring equipment were added to the GIS topographic and site cover database created by INHS.

WETLAND HYDROLOGY CALCULATION FOR 2000

Based on ground-water level measurements collected on site, none of the monitoring wells satisfied wetland hydrology criteria in 2000. However, a limited portion of the site exhibited surface water elevations that satisfied wetland hydrology criteria (see below). This estimate is based on the following factors.

- According to the Midwestern Climate Center, the median date that the growing season begins in Morris is April 16 and the season lasts 188 days; 12.5% of the growing season is 24 days.
- In October and November 1999 and in March 2000, precipitation was below the normal range, leading to dry conditions entering the spring of 2000. Precipitation returned to the normal range in April, and was above average in May, June, and July 2000. Total precipitation for the period from September 1999 to July 2000 was 89% of normal.
- In 2000, water levels measured in none of the wells conclusively satisfied wetland hydrology criteria as outlined in the 1987 U.S. Army Corp of Engineers Wetland Delineation Manual.
- Between April 16 and August 27, 2000, only elevations below 147.83 m (485.0 ft) were inundated by Illinois River floodwaters for a period longer than 23 consecutive days (12.5% of the growing season). This water level would not overtop the bank-full elevation of Mazon Creek and Mud Slough, and would therefore not flood a significant portion of the site for the required period to conclusively satisfy wetland hydrology criteria.

ADDITIONAL INFORMATION

- As water-levels from the Morris USACE gauge on the Illinois River are in approximate agreement with data recorded by ISGS, historical water levels from this station can be applied to the banking site.
- USACE water-level archives were examined for the period from 1949 to the present. These

data indicate that periods of continuous inundation corresponding to 12.5% of the growing season (~23 days) were achieved at an elevation of 147.83 m (485.0 ft) in 40 of 51 years, but at 148.59 m (487.5 ft), this duration of inundation occurred in only 4 of 51 years. To satisfy wetland hydrology over wide areas of the site, sustained water levels of 149.95 to 150.56 m (492.0–494.0 ft) for periods exceeding 23 days would be required. Hence, backflooding of the Illinois River up the Mazon Creek and Mud Slough likely cannot be counted upon alone to provide conclusive wetland hydrology to a significant portion of the bank site. The above 23 day periods in the historical records were not limited to the growing season in Morris. Hence, the periods of inundation may be over-represented resulting in even less floodwater availability during the critical period for wetland hydrology.

At the Morris site, significant areas of floodplain forest exhibiting predominantly hydrophytic vegetation are present at elevations above those which the flood-frequency analysis would indicate are inundated for 12.5% of the growing season. It is therefore possible that on this site, areas which are inundated for between 5 and 12.5% of the growing season may be jurisdictional wetlands. In the spring of 2000, most areas of the site which are NWI-mapped wetlands were inundated by floodwaters, but only briefly and during one or two extreme flood events.

PLANNED FUTURE ACTIVITIES

- Beginning in the fall of 2000, ISGS will contract with a local drainage firm to determine the extent of the known tile system in the east field and possibly locate any tile present elsewhere on the bank site.
- Before the spring of 2001, several S-wells will be installed on site in a number of additional areas mapped by NWI as existing wetlands.
- ISGS and INHS staff are attempting to determine if there is a relationship between on-site elevations and the presence of wetland vegetation. The aim is to determine if areas exhibiting predominantly hydrophytic vegetation exist that may not be continuously inundated for periods exceeding 12.5% of the growing season.
- Monitoring will continue until no longer required by IDOT.

Morris, Illinois River Potential Wetland Banking Site

General Study Area and Vicinity

from the USGS Topographic Series, Morris, IL 7.5-minute Quadrangle (USGS 1993) contour interval is 5 feet



general study area



Morris, Illinois River Potential Wetland Banking Site One-foot topographic contours and ISGS instrument locations Map prepared by Illinois Natural History Survey, May 2000

topographic contours (in feet referenced to NAVD, 1988)

\sim	484
	485
\sim	486
\sim	487
\sim	488
	489
\sim	490
\sim	491
\sim	492
\sim	493
\sim	494
\sim	495
\sim	496

- Drainage tile location
- Monitoring well
- Rain gauge

Surface water station

□ 1000 feet







Depth to Water





Depth to Water









Morris, Illinois River Potential Wetland Banking Site August 1999 through August 2000

Total Monthly Precipitation Recorded On Site and at the Channahon, IL Weather Station



on-site rain gauge not deployed for entire month

 \triangle suspect data: rain gauge vandalized, represents a minimum value for the month

* see text for explanation

Graph last updated September 20, 2000

SITE HISTORY

- May 1996: ISGS submitted an Initial Site Evaluation Report to IDOT.
- Spring 1999: ISGS began water-level monitoring activities.
- September 1999: Surface-water monitoring initiated on Edwards River adjacent to the site with an Infinities sonic data logger. A total of 12 sediment traps were also added at nine locations site-wide.

WETLAND HYDROLOGY CALCULATION FOR 2000

As in 1999, no significant portion of the wetland compensation area satisfied wetland hydrology criteria in 2000. This estimate is based on the following factors.

- According to the Midwestern Climate Center, the median date that the growing season begins in Aledo is April 11 and the season lasts 194 days; 12.5% of the growing season is 24 days.
- In October and November 1999, precipitation was below the normal range, leading to dry conditions entering the spring of 2000. Precipitation was above the normal range in April and May 2000, and was likely above normal in June 2000 (malfunctioning on-site rain gauge), resulting in wet conditions later than in a typical spring. Total precipitation for the period from September 1999 to May 2000 was 97% of normal.
- In 2000, water levels measured in only one of the wells (1S) conclusively satisfied wetland hydrology criteria as outlined in the 1987 U.S. Army Corp of Engineers Wetland Delineation Manual. However, no significant area around well 1S could be included based on adjacent wells and stream-gauge data. In addition, well 3S may have satisfied the wetland hydrology criteria.
- The wetland compensation site was more or less completely inundated on four separate occasions in the spring of 2000. However, the longest sustained period of inundation was 1.7 days, insufficient to satisfy wetland hydrology criteria. This analysis of frequency of site inundation was undertaken using hourly stage data from the Edwards River adjacent to the site, as well as ground surface elevations from IDOT as-built plans, and ISGS monitoring well surveys.
- Limitations of the wetland hydrology determination are as follows:
 - Estimates of inundated area from stream flooding levels are based on a rudimentary as-built construction plan.
 - Monitoring well and sediment trap locations are estimated.
 - S-wells may not be responding in a timely fashion to surface water inundation, likely

due to low-permeability surficial materials.

- Continuous logging of shallow ground-water levels is needed in the wetland basin.

ADDITIONAL INFORMATION

 No measurable amounts of sediment were noted in any of the 12 traps deployed on site, however, a film of sediment was noted inside the collectors. Using Edwards River stage data, it would appear that the inlet elevations of all 12 sediment traps on site were exceeded by floodwaters for less than 3 days. Silt-stained vegetation and silt marks on well casings were noted, although conspicuous sediment deposits were absent. Substantial pieces of woody flood debris (ranging from twig to log size) were also deposited on the site during spring 2000 flood events. Due to the design of the wetland basin and general flashiness of the Edwards River flood response, water velocity through the site may be too rapid to deposit significant sediment in the basin.

PLANNED FUTURE ACTIVITIES

- Monitoring of hydrology and sediment deposition will continue through Spring 2004 or until no longer required by IDOT.
- Well locations and site features will be surveyed via GPS and a topographic survey will be undertaken for comparison to the IDOT as-built plan. In general, however, ground-surface elevations at monitoring wells acquired by ISGS using standard surveying instruments are comparable to as-built elevations provided by IDOT.
- An RDS data logger will be installed to monitor shallow ground-water in the wetland basin.
- Several very shallow (VS) monitoring wells will be installed to determine if current S-wells are too deep to respond in a timely fashion (or at all) to surface water inputs.
- In conjunction with IDOT, the role of on-site ditches will be assessed in this monitoring year. It is possible that the site is being too efficiently drained, and that blockage of these ditches would cause longer-term ponding of water in the excavated basin. This may also enhance sediment deposition on the site due to the longer floodwater residence time.

Edwards River, Mercer County Wetland Compensation Site (FAP 310)

General Study Area and Vicinity

from the USGS Topographic Series, Viola, IL and Matherville, IL 7.5 Minute Quadrangles contour interval is 10 ft



general study area

Edwards River, Mercer County Wetland Compensation Site (FAP 310)

Approximate Locations of ISGS Monitoring Wells, Sediment Traps, Water-Level Logger and Stage Gauge

map based on unrectified aerial photography from IDOT (1998, NAPP 52-553) and an as-built survey



Edwards River, Mercer County Wetland Compensation Site September 1, 1999 to September 1, 2000



Water-Level Elevations

Edwards River, Mercer County Wetland Compensation Site September 1, 1999 to September 1, 2000



Depth to Water

Edwards River, Mercer County Wetland Compensation Site September 1999 through August 2000

Total Monthly Precipitation Recorded On Site and at the Aledo, IL Weather Station



on-site rain gauge not deployed for entire month

ightarrow suspect data: clogged rain collector, represents a minimum value for the month

@ weather station not reporting

* see text for explanation

Graph last updated September 15, 2000

LUEHMANN PROPERTY, NEW RIVER CROSSING POTENTIAL WETLAND COMPENSATION SITE FAP 999 Madison County, near Stallings, Illinois Primary Project Manager: D. Bradley Ketterling Secondary Project Manager: Keith W. Carr

SITE HISTORY

- February 2000: The ISGS was tasked to perform a Level II hydrogeologic assessment of the site.
- March 2000: Nine well clusters, one staff gauge, and one rain gauge were installed.
- April and June 2000: Additional water-level loggers were installed on site.

SUMMARY OF 2000 EVENTS

Because this site is a potential compensation site, an estimate of the areas satisfying the criteria for wetland hydrology is not needed.

- According to the Midwestern Climate Center, the median length of the growing season at Belleville, Illinois is 203 days, starting April 5 and ending October 24. Therefore 12.5% of the growing season is 25 days.
- No areas of the site other than the riparian zone around the perimeter of the pond met the criteria for wetland hydrology. Six of the nine soil-zone monitoring wells remained dry through August. The bathymetry of the pond itself has not yet been determined. A substantial amount of the pond may be classified as deep-water habitat, greater than 2 m (6.6 ft), and hence may not meet the criteria for wetland hydrology.
- The water level of the borrow-pit pond remained fairly constant through the spring months, rising about 70 cm (2.3 ft) over three days in response to 3.71 inches of rainfall from June 23 through the 26.
- The east ditch apparently drains the majority of the site. The west ditch drains a thin strip of farmland along the western perimeter and receives substantial runoff from Interstate 255. Both ditches respond quickly to precipitation events but are otherwise dry. Flow in the west ditch is impeded slightly by a riprap berm that crosses the ditch just upstream of the box culvert.
- Water levels in the deeper M and L wells rose gradually over the summer. Most responded to the heavy precipitation in late June. M-wells showing the highest water levels were those near large drainage ditches having standing water for long time periods (1M, 3M, and 5M). These ditches may be acting as localized recharge points, causing a downward vertical ground-water flow. Downward vertical gradients were also observed at clusters 2 and 6. No appreciable vertical gradient was observed at well clusters 4, 7, 8 and 9 (*i.e.* the water levels in the M and L wells were very similar).

PLANNED FUTURE ACTIVITIES

- A flow meter will be installed in the box culvert under Interstate 255 to more accurately measure the discharge through the culvert during storm events. In addition, the gradient of the culvert will be accurately surveyed. The stage/discharge relationships for the two feeder ditches will continue to be refined so that their relative contribution can be estimated. However, the complicated nature of the channels (*e.g.* bifurcations, localized changes in gradient, debris obstructions, vegetation) may preclude the possibility of accurate calculations of the volume of water discharged.
- Staff gauges will be added to the ditches running along IL 162 and I-255 near wells 1M and 5M.
- Percolation tests and/or S-well slug tests will be conducted at a number of locations.

Luehmann Property, New River Crossing Potential Wetland Compensation Site (FAP 999)

General Study Area and Vicinity

from the USGS Topographic Series, Monks Mound, IL 7.5-minute Quadrangle (USGS 1993) contour interval is 10 feet



Luehmann Property, New River Crossing Potential Wetland Compensation Site (FAP 999)

Approximate Locations of ISGS Monitoring Wells, Pressure Transducers, and Staff Gauges

(map based on NAPP aerial photography, 43-472, 4/2/98)





Depth to Water in Soil-Zone Monitoring Wells





Water-Level Elevations

-0.5 0.0 Depth (in m referenced to land surface) 0.5 1.0 ———Well 1M -D-Well 2M 1.5 ← Well 3M → Well 4M ● Well 5M 2.0 -o-Well 6M → Well 7M 2.5 –∆– Well 8M -+-Well 9M 3.0 3.5 4.0 Sep 1999 Aug 2000 Sep 2000 Nov 1999 Mar 2000 Apr 2000 Jul 2000 Oct 1999 Dec 1999 Jan 2000 Feb 2000 May 2000 Jun 2000

Depth to Water in Middle Monitoring Wells




Luehmann Property, New River Crossing Potential Wetland Compensation Site September 1, 1999 to September 1, 2000

Depth to Water in Lower Monitoring Wells





Luehmann Property, New River Crossing Potential Wetland Compensation Site: March 15 to September 1, 2000



Water Level in the Borrow-Pit Pond and in Adjacent Wells 7M and 7L

Luehmann Property, New River Crossing Potential Wetland Compensation Site September 1999 through August 2000

Total Monthly Precipitation Recorded On Site and at the Edwardsville, IL Weather Station



on-site rain gauge not deployed for entire month * see text for explanation

Graph last updated September 15, 2000

SITE HISTORY

- February 2000: ISGS was tasked by IDOT to conduct a Level II hydrogeologic assessment of the site.
- Spring 2000: ISGS began on-site activities with the installation of surface-water monitoring equipment and two monitoring wells in selected areas.

WETLAND HYDROLOGY CALCULATION FOR 2000

No wetland hydrology calculation has been made for this monitoring period, for the following reasons:

- The instrumentation currently deployed on site has not been recording for a significant portion of the 1999–2000 monitoring period.
- Benchmarks have yet to be established on site, therefore instrument elevations have not been determined.
- On-site drilling and monitoring-well emplacement will be conducted upon completion of the pending property transaction.

PRELIMINARY INFORMATION

- According to the Midwestern Climate Center, the median date that the growing season begins in nearby Rushville is April 7 and it lasts 207 days; 12.5% of the growing season is 26 days.
- A preliminary analysis of flood height data from the Illinois River suggests that, if the site were open to flooding from the Illinois River, approximately 70% of the site would be inundated in 5 out of 10 years for a duration sufficient to satisfy wetland hydrology criteria. This analysis is based on daily average stage data of the Illinois River acquired at the USACE new La Grange Lock and Dam gauging station, which is located approximately 1.6 km (1 mi) downstream of the site. From USGS topographic mapping (1980), it was determined that at an elevation of 132.58 m (434.99 ft), approximately 70% of the site would be inundated. According to the USACE data, during the period from 1990 to 1999, this elevation was exceeded for a period of greater than 26 consecutive days of the growing season in 5 of 10 years. Further examination of historical stage records will be necessary to determine if the decade used in this analysis is typical of the period of record. Additional water from groundwater discharge, overland flow from the bluffs to the southwest, and onsite precipitation is also likely to influence the site hydrology.

PLANNED FUTURE ACTIVITIES

- Monitoring of hydrology will continue until no longer required by IDOT.
- As soon as access is granted, nested monitoring wells for determining geologic and hydrogeologic control will be drilled on site.
- Four permanent survey monuments will be installed on site in the fall of 2000, and the
 elevations of these determined by IDOT District staff. All instruments on site will then be
 elevation surveyed from these benchmarks. ISGS will then use GPS to locate site features,
 boundaries, and ISGS instrument locations. No hydrogeologic data will be available prior
 to obtaining the site survey data.

Wessel Property Potential Wetland Bank Site

General Study Area and Vicinity

from the USGS Topographic Series, Cooperstown, IL 7.5-minute Quadrangle (USGS 1980) contour interval is 10 feet



Wessel Property Potential Wetland Bank Site

Approximate Locations of ISGS Monitoring Equipment

map based on unrectified aerial photography from USDA (1979)

