



# SUSQUEHANNA RIVER BASIN COMMISSION

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**Docket No. 20050905**

**Approval Date: September 14, 2005**

## **WMPI PTY, L.L.C.**

Groundwater Withdrawal of 7.000 mgd (30-Day Average) and  
Consumptive Water Use of Up to 3.470 mgd (Peak Day)  
for the Gasification and Liquefaction of Coal Waste,  
and for the Ancillary Generation of Steam and Electricity,  
Mahanoy and West Mahanoy Townships, Schuylkill County, Pennsylvania

### **Review Authority**

This project is subject to review pursuant to Article 3, Section 3.10, of the Susquehanna River Basin Compact (Compact), P.L. 91-575, 84 Stat. 1509 et seq., and Susquehanna River Basin Commission (Commission) Regulations §803.4, relating to projects requiring review and approval; §803.42, relating to the consumptive use of water; and §803.43, relating to groundwater withdrawals. The Commission received the application on April 15, 2003, and the project sponsor submitted additional supporting information on August 28, 2003, and April 4, 2005.

### **Description**

**Purpose.** The purpose of the application is to request approval for the withdrawal and consumptive use of water for the production of low-sulfur liquid fuels such as diesel oil and naphtha from primarily anthracite coal waste (“culm”), and possibly in part from petroleum coke or biomass, through a gasification and liquefaction process, with byproducts including high-grade sulfur and a fine vitreous aggregate (slag and/or fly ash). The process also involves the ancillary generation of steam for possible industrial use and electricity generation in a gas turbine, which will burn excess process off-gases.

**Location.** The project is located in the Lower Susquehanna Subbasin, HUC 02050301, Mahanoy Creek Watershed, Mahanoy and West Mahanoy Townships, Schuylkill County, Pennsylvania.

**Project Features.** The project sponsor has requested approval for the withdrawal of 7.000 million gallons per day (mgd) (30-day average) of groundwater and the consumptive use of water of up to 3.470 mgd (peak day; 3.300 mgd as a 30-day average) for a coal waste gasification and liquefaction plant.

The proposed WMPI PTY, L.L.C. (WMPI) gasification and liquefaction facility will be located east of the Borough of Frackville, on a broad east-northeast, west-southwest trending ridge, which is on the south-southeastern side of the Mahanoy Creek Valley. The location is adjacent to the existing Gilberton Power Corporation fluidized bed, coal-waste-burning power plant.

Groundwater will be withdrawn from the Gilberton Mine Pool (a flooded deep mine) at the Gilberton Mine Shaft. The Gilberton Mine Pool is bordered on the west by the Lawrence Mine Pool, on the north by the East Bear Ridge Mine Pool, and on the east by the St. Nicholas and Boston Run Mine Pools.

Currently, there are three other withdrawals at the mine pool. The Pennsylvania Department of Environmental Protection (PADEP) operates a pump at the Gilberton Mine Shaft to maintain a depressed water level in the mine pool to prevent basement flooding in the adjacent Village of Gilberton. Groundwater is also withdrawn from the Gilberton Mine Shaft and consumptively used by Gilberton Power Corporation, previously approved by the Commission in Docket No. 19851202. WMPI Coal Preparation Plant currently withdraws 2.160 mgd of groundwater from the Gilberton Mine Shaft for its existing coal and/or coal waste processing operations.

Water will be used consumptively at the facility in primarily three ways. The largest consumptive use will be evaporation and drift losses from the cooling water system, which will amount to approximately 2.530 mgd. Water consumed in the actual gasification-liquefaction process will amount to approximately 0.540 mgd. Water injected as steam into a gas turbine burning excess process off-gas will amount to approximately 0.230 mgd. Other lesser consumptive uses include potential moisture addition to fly ash to improve handling characteristics.

Of the 7.000 mgd (30-day average) to be pumped from the Gilberton Mine Pool, the project sponsor intends to re-infiltrate up to 3.700 mgd (30-day average) of treated process wastewater in an existing tailings pond in the Mahanoy Creek valley located approximately 1 mile east of the Gilberton Mine Shaft. This tailings pond was constructed prior to 1971 and is currently used by WMPI. The pond, located over the Boston Run Mine Pool, was previously used by B&D Mining Company as part of its coal and/or coal waste processing operations.

**Pumping Test.** The project sponsor has requested that the required constant-rate pumping test of the Gilberton Mine Pool be waived. The Pennsylvania Department of Environmental Resources (PADER, predecessor agency of PADEP) conducted a 10-day pumping test at the Gilberton Mine Shaft in 1976 that showed the Gilberton and the Lawrence Mine Pools are well interconnected. Water levels measured in the St. Nicholas Mine Pool were substantially higher than those in the Gilberton Mine Pool and lower in the West Bear Ridge Mine Pool than in the Gilberton Mine Pool, and these mine pools demonstrated no drawdown from the pumping in the Gilberton Mine Pool. Long-term hydrographs of the few available boreholes in some of the mine pools confirm that barrier pillars between the various mine pools have not all been breached or so severely compromised so as to allow free flows of groundwater among the mine pools.

**Coordination.** Commission staff has coordinated with the PADEP Bureau of Abandoned Mine Reclamation (BAMR), Wilkes-Barre District Office; the Water Management Program in the Northeast Region Office; and Bureau of Mining and Reclamation (BMR), Pottsville District Office, during review of the project.

### **Findings**

The project is subject to Commission approval and reporting requirements, as per Commission Regulations §803.42 and §803.43.

All water: (1) mixed with the feedstock in the gasification-liquefaction process; (2) lost through steam injection in the gas turbine; (3) lost as drift and from evaporation from the cooling water system; and (4) used in wetting fly ash for improved handling, is considered to be consumptively used. Commission staff recommends that the project's total daily consumptive water use be calculated as the difference between raw water inflow and treated wastewater discharge minus any stormwater infiltration.

Commission staff recommends that the project sponsor submit a metering plan to accurately quantify the daily consumptive water use at the facility for review and approval by Commission staff. The plan should contain metering, accurate to within five percent, on the raw water withdrawal from the Gilberton Mine Shaft, on the treated wastewater discharge, and other locations, as appropriate. The project sponsor should report the daily consumptive water use data to the Commission quarterly.

Should the proposed accounting procedure fail to accurately measure the project's consumptive water use, the Commission reserves the right to modify the metering, monitoring, and accounting procedures. Commission staff will provide the project sponsor with written notice of any required change in the metering, monitoring, and accounting procedures. Any alternative monitoring or accounting procedure requested by the project sponsor must be reviewed and approved by Commission staff.

The project's consumptive use of water is subject to water compensation requirements, as per Commission Regulation §803.42. To satisfy these requirements, the project sponsor proposes to make quarterly payments to the Commission in lieu of providing actual compensation water.

The project sponsor has requested a groundwater withdrawal of 7.000 mgd, as a 30-day average, at the Gilberton Mine Shaft in the Gilberton Mine Pool at an anticipated pumping rate of 4,900 gallons per minute (gpm). The proposed source of water is part of an extensive network of abandoned and flooded mine workings beneath the Mahanoy Creek valley that collectively stores large quantities of water, measured in billions of gallons. Based on the nature of the source, the project sponsor requested a waiver of the required constant-rate pumping test.

Commission staff reviewed the groundwater availability analysis submitted by the project sponsor's geologic consultant, historic pumping test results, and supporting information

submitted by the project sponsor. The Pennsylvanian-Age Llewellyn Formation within the Mahanoy Creek valley has been extensively deep mined and surface mined for anthracite coal, and unreclaimed, mining-disturbed land is extensive in the valley bottom and on the lower valley walls. This synclinal valley forms the Western Middle Anthracite Coal Field.

The abandoned deep mines in the valley are flooded and form artificial aquifers, commonly termed “mine pools,” of extremely high transmissivity. During deep mining, un-mined sections or “barrier pillars” were maintained between the various deep mines to prevent flooding of active mines when adjacent mines were abandoned. Some of these barriers were breached, interconnecting and allowing large groundwater flows between some mine pools. In other locations, the barriers are intact, allowing only limited leakage between mine pools.

This degree of interconnection among the mine pools is a critical underlying assumption in the review of the project as it relates to the idea of “vastness” of the collective mine pool (artificial aquifer). However, considering the Mahanoy Creek watershed, including the approximately 8.15-square-mile area upgradient of the Gilberton and Lawrence Mine Pools, Commission staff concludes that recharge is likely in the range of 5.150 to 8.150 mgd during a 1-in-10-year drought. When combined with the collective storage available, Commission staff finds that the water resources are sufficient to support the proposed development. The water supply may need to be withdrawn from more than one mine pool to meet the project’s demand and avoid local adverse impacts.

Commission staff recommends approval of the requested maximum instantaneous pumping rate of 4,900 gpm and an average daily withdrawal of 7.000 mgd (as a 30-day average), consistent with: (1) the probable sustainable yield of mine pool complex; (2) projected needs, as submitted by the project sponsor; and (3) protective drawdown limits, as described below.

Sustainable Yield of the Mine Pool. PADEP has collected over 30 years of pumping data for the Gilberton Mine Pool through its control of the mine pool elevation to prevent basement flooding in the Village of Gilberton following Hurricane Agnes in 1972. The record of withdrawal from the mine pool by PADEP demonstrates that 7.400 mgd can be supplied from the Gilberton Mine Shaft during all but the most severe droughts.

PADEP’s pumping test clearly established a connection only between the Gilberton and the Lawrence Mine Pools. Commission staff finds that the connected mine pools (Gilberton and Lawrence) have a recharge area of approximately 2 square miles, and determined that the total recharge available is approximately 2.500 mgd using a 1-in-2-year recharge rate of 1.260 mgd per square mile. This recharge rate considers that infiltration rates over land disturbed by mining may be higher than average.

Local direct recharge on the mine pools likely accounts for approximately one-third of the demonstrated yield from the Gilberton Mine Pool of 7.400 mgd. Other sources of recharge must supply the balance. Although some leakage likely occurs from the neighboring mine pools, the pumping test demonstrated that the St. Nicholas and Boston Run Mine Pools do not have an efficient hydraulic connection and, therefore, cannot significantly contribute to a withdrawal from the Gilberton and Lawrence Mine Pools. Commission staff has identified flow losses from

Mahanoy Creek as it flows over the Gilberton and Lawrence mines as a plausible source of the remaining 4.900 mgd (which brings the total to 7.6 cubic feet per second [cfs]).

Commission staff recommends that the project sponsor perform seepage runs of Mahanoy Creek in July, August, and September during the first two years of project operation to confirm the magnitude and location(s) of flow losses. The seepage runs should be conducted along the reach passing over the Gilberton Mine Pool and for 500 feet upstream and downstream of the mine pool, or as directed by Commission staff. Flow measurement stations should be spaced a maximum of 500 feet apart. The seepage runs should be performed during a period of base flow, and the results tabulated and reported in an interpretive report to the Commission within 30 days of the date of the streamflow measurements. The report should contain a description and an analysis of the results, and a map showing all of the flow measurement stations and the associated flows.

With time, as abandoned mine lands in the valley are reclaimed, recharge rates to the mine pools may diminish, which may limit the available water supply. In order to insure sustainability of the water supply for the project, Commission staff recommends that the project sponsor repeat these seepage studies after 10 years of project operation. The project sponsor should submit a plan for the fieldwork for review and approval by Commission staff within 90 days of Commission approval. The seepage runs should be performed during a period of base flow during the months of July, August, and September, and the results tabulated and reported in an interpretive report to the Commission within 30 days of the date of the streamflow measurements. The report should contain a description and an analysis of the results, and a map showing all of the flow measurement stations and the associated flows.

Projected Needs. Existing withdrawals from the Gilberton Mine Shaft currently include approximately 2.000 mgd (up to 1.510 mgd approved for consumptive water use) for Gilberton Power Corporation and a reported 2.160 mgd by WMPI Coal Preparation Plant for its coal waste processing operations. The project sponsor's geologic consultant asserts that the current total "net" withdrawal is much less, approximately 2.700 mgd due to recirculation of process wastewater. Similarly, the project's geologic consultant anticipates that the additional "net" withdrawal for WMPI is on average 3.300 mgd, assuming that the treated wastewater from the plant re-infiltrates through the tailings pond into the Boston Run Mine Pool and effectively recirculates to the Gilberton Mine Pool.

However, if the Boston Run Mine Pool and the Gilberton Mine Pool are not well interconnected and recirculation of treated wastewater is ineffective, the effective withdrawal from the Gilberton Mine Pool will approach the withdrawal limit of 7.000 mgd. The project sponsor should monitor the water level in the Gilberton Mine Pool. If it becomes apparent that the mine pool level would have to be drawn down to the meet water supply demand of the gasification-liquefaction plant during drought periods, the project sponsor could investigate an alternate means of re-infiltrating the treated wastewater so that it more effectively recirculates to the Gilberton Mine Pool. As an alternative, the project sponsor could develop an additional water supply in another mine pool to meet the project's demand. If the project sponsor proposes to withdraw groundwater from another location in the Gilberton Mine Pool or any other mine

pool, the project sponsor must submit the required application(s) to the Commission for its review and approval.

Protective Drawdown Limits. PADEP maintained the level of the Gilberton Mine Pool in the elevation range of 1,094 to 1,112 feet above mean sea level (AMSL) through automated, level-controlled pumping up until 1998. Since that time, PADEP has maintained the pool level at or below elevation of 1,113 feet, using manual pumping. The pump shut off currently is set at an elevation of 1,096 feet AMSL.

The project sponsor's geologic consultant presented an analysis of PADEP's pumping records for the Gilberton Mine Shaft, and an analysis of drought recharge rates and storage in the mine pools. This analysis indicates that if the net withdrawal from the Gilberton Mine Shaft is on the order of 3,300 mgd, drawdown of the Gilberton Mine Pool during drought periods should not be more than an average of 12 feet, which is within the range of drawdown created since active pumping at the Gilberton Mine Shaft was begun by PADEP.

However, this analysis further indicated that if the recirculation is not effective and the net withdrawal approaches 7,000 mgd, drawdown of the Gilberton Mine Pool of as much as 100 feet could be created during drought periods. Such large drawdowns have the potential to induce mine subsidence in the project area. As the project sponsor has not demonstrated a good interconnection between the Boston Run Mine Pool over which re-infiltration of treated wastewater will occur and the Gilberton Mine Pool from which the groundwater withdrawal will take place, and as recharge rates to the mine pools may diminish as abandoned mine lands in the Mahanoy Creek valley are reclaimed, Commission staff recommends long-term monitoring of the level of the Gilberton Mine Pool.

Further, to insure that the planned withdrawal does not cause excessive drawdown of this mine pool, Commission staff recommends that if drawdown reaches an elevation of 1,087 feet AMSL at the Gilberton Mine Shaft, the project sponsor should evaluate the potential for additional drawdown. Should these projections show that the water level will reach 1,084 feet AMSL, the project sponsor should prepare and submit the necessary applications to the Commission for supplemental withdrawal location(s). This elevation represents a reasonable balance between the lowest level of the mine pool since active pumping began in the 1970s, potentially adverse impacts from subsidence, and the water supply needs of the project.

Commission staff also recommends that the project sponsor carry out a program of monitoring of the water levels in the Boston Run and St. Nicholas Mine Pools, and other nearby mine pools as appropriate, as future decisions on managing the Gilberton Mine Pool and adjacent mine pools as artificial aquifers to support the high water demand of this new project, that of the existing Gilberton Power Corporation plant, and the existing processing operation of WMPI, will depend on a complete groundwater level database.

Other Considerations. There are several public water supply wells in the Borough of Frackville, on the broad ridge on the south side of the valley, the closest of which is the Nice Street Well. This well is located approximately 1.6 miles southwest of the Gilberton Mine Shaft and approximately 2,000 feet south of the southern limit of the combined Gilberton-Lawrence

Mine Pool. The Nice Street Well is drilled into the Mississippian-Age Mauch Chunk Formation, and it is across strike from the mine pools of the Mahanoy Creek valley, on the southern limb of the syncline. Commission staff finds that the potential for significant adverse impact to this well is highly unlikely and, therefore, does not recommend any additional monitoring at this time.

Based on the findings above, Commission staff recommends that the requirement for the pumping test be waived for the proposed withdrawal at the Gilberton Mine Shaft.

The project is subject to water conservation requirements, as per Commission Regulation §804.20(b).

The project sponsor has paid the appropriate application fee, in accordance with Commission Regulation §803.28, and in accordance with Commission Resolution No. 98-19, as amended by Commission Resolution 2000-06. The project sponsor has provided all proofs of notification, as required by Commission Regulation §803.25.

No adverse impacts to other area groundwater withdrawals are anticipated. The project is physically feasible, does not conflict with or adversely affect the Commission's Comprehensive Plan, and does not adversely influence the present or future use and development of the water resources of the basin.

### **Decision**

1. The project's groundwater withdrawal of 7.000 mgd (30-day average) from the Gilberton Mine Pool, and the consumptive use of water of up to 3.470 mgd (peak day) are approved pursuant to Article 3, Section 3.10, of the Compact.

2. The foregoing findings are hereby adopted and shall be incorporated into and made a part of this decision.

3. The project sponsor shall comply with all Commission regulations, including consumptive water use reporting requirements, as per Commission Regulation §803.42, and groundwater withdrawal reporting requirements, as per Commission Regulation §803.43.

4. Prior to commencing operation, the project sponsor shall install and then maintain meters, accurate to within five (5) percent, to measure the daily quantity of water entering and leaving the facility's process water system. The project sponsor may propose alternative monitoring to the Commission for staff review and approval.

5. The project sponsor shall keep daily records of the project's consumptive water use, and shall report the data to the Commission quarterly, and as otherwise required. Quarterly monitoring reports are due within thirty (30) days after the close of the preceding quarter. The daily quantity of water consumptively used shall be the difference in quantity of water pumped from the Gilberton Mine Shaft and the quantity of treated wastewater discharged to the tailings pond. The Commission reserves the right to inspect all measurement equipment and audit all measurement records.

6. Within sixty (60) days from the date of this approval, the project sponsor shall submit a metering plan to the Commission for review and approval by Commission staff that accounts for all water withdrawn from the Gilberton Mine Shaft, the treated wastewater discharge, and the total consumptive water use at the facility, as well as accounts for water discharged as wastewater through stormwater flows. The project sponsor shall propose a methodology to account for its consumptive water use based on metering, rather than estimation. Following approval, the project sponsor shall execute the plan and complete any installation of meters in accordance with the approved schedule, and shall certify to the Commission that the monitoring plan has been implemented. The project sponsor shall maintain meters, accurate to within five (5) percent.

7. The maximum instantaneous pumping rate from the Gilberton Mine Shaft shall not exceed 4,900 gpm.

8. If the pumping water level in the Gilberton Mine Shaft reaches 1,087 feet AMSL, the project sponsor shall submit its projections and evaluation of anticipated additional drawdown. Should the evaluation show that the water level will decline below 1,084 feet AMSL, the project sponsor shall submit the appropriate application(s) for supplemental withdrawal locations.

9. The project sponsor shall install and maintain metering on the groundwater withdrawal, accurate to within five (5) percent, and keep daily records of the project's groundwater withdrawal, and measure water levels at the Gilberton Mine Pool, as described in Condition 10. The project sponsor shall report the data to the Commission quarterly, and as otherwise required. Quarterly monitoring reports are due within thirty (30) days after the close of the preceding quarter. The Commission reserves the right to inspect all measurement equipment and audit all measurement records.

10. The project sponsor shall monitor the water levels in the Gilberton Mine Pool, and in all the mine pools immediately surrounding the Gilberton Mine Pool, daily. Within sixty (60) days from the date of this approval and prior to commencing withdrawals from the Gilberton Mine Shaft, the project sponsor shall submit a plan for monitoring these mine pools to the Commission for review and approval by Commission staff. The monitoring data shall be submitted to the Commission in a quarterly report due within thirty (30) days after the close of the preceding quarter. The report shall contain both a description and an analysis of the monitoring results, and include a map with all of the monitoring points and their associated water levels, expressed as feet AMSL.

11. The project sponsor shall perform seepage runs of Mahanoy Creek along the reach passing over the Gilberton Mine Pool complex, and for an additional 500 feet upstream and downstream. The seepage runs shall be performed during a period of base flow, during the months of July, August, and September, for the first two years of project operation (a total of six seepage runs). Flow measurement stations shall be no further than 500 feet apart. These shall be submitted to the Commission in a report due by October 31. The report shall contain both a description and an analysis of the results, and include a map with all of the flow measurement points and their associated flows.

12. In 2016, or after 10 years of operation, whichever comes later, the project sponsor shall repeat the seepage runs of Mahanoy Creek along the reach passing over the Gilberton Mine Pool complex, and for an additional 500 feet upstream and downstream. The seepage runs shall be performed during a period of base flow, during the months of July, August, and September, for the first two years of project operation (a total of six seepage runs). Flow measurement stations shall be no further than 500 feet apart. These shall be submitted to the Commission in a report due by October 31. The report shall contain both a description and an analysis of the results, and include a map with all of the flow measurement points and their associated flows.

13. To satisfy the Commission's current compensation requirements for consumptive water use set forth in Commission Regulation §803.42, the project sponsor shall make quarterly payments to the Commission based on the rate of \$0.14 per 1,000 gallons of water consumptively used by the project. The daily quantity of water consumptively used shall be the difference between the quantity of water pumped from the Gilberton Mine Shaft and the quantity of treated wastewater returned to the tailings pond for re-infiltration. Payments shall be made quarterly and shall be calculated by applying this rate to the daily amount of water consumptively used by the project during the preceding calendar quarter. Quarterly payments are due and payable within thirty (30) days after the close of the preceding quarter. The rate of payment, after appropriate notice to consumptive users of water using this method of compliance, is subject to change at the Commission's discretion.

14. The project sponsor shall comply with the water conservation requirements specified in Commission Regulation §804.20(b).

15. The constant-rate pumping test requirement specified in Commission Regulation §803.43 (b) is hereby waived.

16. If the Commission determines that the operation of the project's groundwater withdrawal from the Gilberton Mine Shaft adversely affects any existing groundwater or surface water withdrawal, the project sponsor shall be required to provide, at its expense, an alternate water supply or other mitigating measure.

17. Commission approval shall not be construed to exempt the project sponsor from obtaining all necessary permits and/or approvals required for the project from other federal, state, or local government agencies having jurisdiction over the project. The Commission reserves the right to modify, suspend, or revoke this action if the project sponsor fails to obtain or maintain such approvals.

18. The Commission reserves the right to inspect or investigate the project facility, and the project sponsor shall allow authorized employees or agents of the Commission, without advance notice or a search warrant, at any reasonable time and upon presentation of appropriate credentials, and without delay, to have access to and to inspect all areas where the project is being constructed, operated, or maintained. Such employees or agents shall be authorized to conduct tests or sampling; to take photographs; to perform measurements, surveys, and other tests; to inspect the methods of construction, operation, or maintenance; to inspect all

measurement equipment; to audit, examine, and copy books, papers, and records pertinent to any matter under investigation; and to take any other action necessary to assure that the project is constructed, operated, or maintained in accordance with the terms and conditions of this approval or any other rule, regulation, or order of the Commission.

19. If the project sponsor fails to comply with the provisions of the Compact or any rule, regulation, or order of the Commission, or any term or condition of this docket, the Commission may suspend, modify, or revoke its approval of same, and may impose appropriate penalties. Upon written notice by the Commission, the project sponsor shall have thirty (30) days to correct such noncompliance, unless an alternate period is specified in the notice. Nothing herein shall preclude the Commission from exercising its authority to immediately modify, suspend, or revoke this approval where it determines exigent circumstances warrant such action, or from imposing fines and penalties, regardless of the period of noncompliance.

20. The Commission reserves the right to reopen any project docket or issue such additional orders, as may be necessary, to mitigate or avoid adverse impacts or otherwise to protect public health, safety, welfare, or the environment.

21. Commission approval confers no property rights upon the project sponsor. The securing of all rights necessary and incident to the project sponsor's development and operation of the project shall be the sole and exclusive responsibility of the project sponsor, and this approval shall be subject thereto.

22. This approval is effective until September 14, 2030. The project sponsor shall submit a renewal application by March 14, 2030, and obtain Commission approval prior to continuing operation beyond September 14, 2030.

23. The project sponsor has a period of three (3) years from the date of this approval to initiate the project or such approval will automatically expire, unless an extension is requested by the project sponsor and approved by the Commission. Likewise, if the project is discontinued for such a time and under such circumstances that an abandonment of the project may be reasonably inferred, the Commission may rescind the approval of the project unless a renewal is requested by the project sponsor and approved by the Commission.

By the Commission:



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Col. Francis X. Kosich, Chair  
U.S. Commissioner

Dated: September 14, 2005