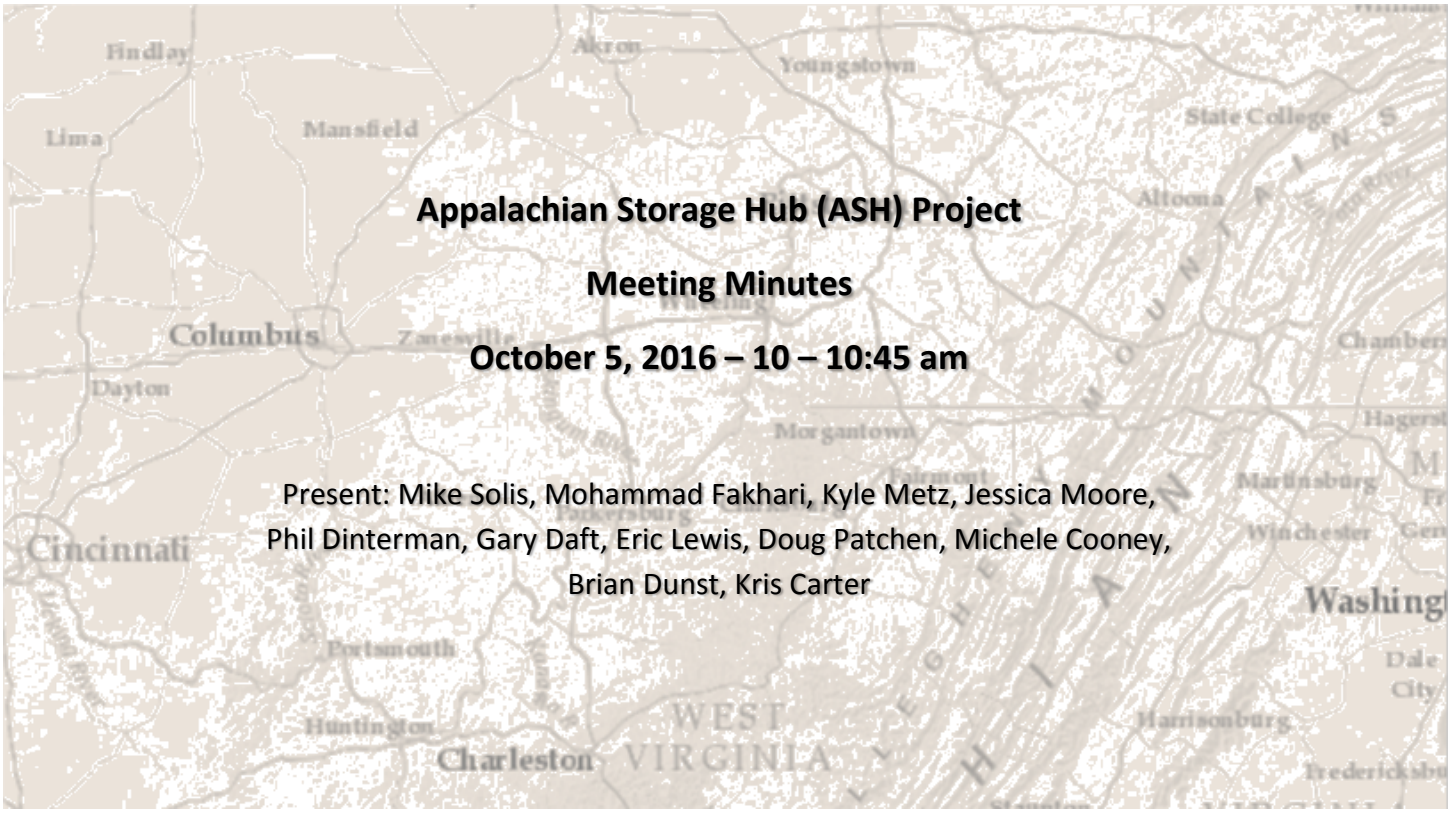


Appalachian Storage Hub (ASH) Project

Meeting Minutes

October 5, 2016 – 10 – 10:45 am

Present: Mike Solis, Mohammad Fakhari, Kyle Metz, Jessica Moore, Phil Dinterman, Gary Daft, Eric Lewis, Doug Patchen, Michele Cooney, Brian Dunst, Kris Carter

1) Data Communication and Sharing

WVGES has established an FTP site for the ASH project. The site can be accessed at the following URL:

ftp://gisonline.wvgs.wvnet.edu/ASH

Researchers have been given login credentials. The Research Team has 'Read/Write' access to the data, and Industry Members have 'Read' access.

Michele Cooney has been given administrative control of the FTP and is working to organize the data. The FTP site was initially populated with data taken from the Utica Shale Playbook Study; Michele will remove data from areas outside the ASH project area of interest using a county list compiled from the initial statement of work. She is also working to implement a coding system for data organization. If possible, data will be organized by API number, data type, and play (SLNA for Salina; GRBR for Greenbrier; DGAS for depleted gas fields). Data files from aggregate sources (static maps, cross-sections and mapping projects) will be categorized separately.

A request to Industry partners for supplemental data was met with some success. Chevron donated a set of geophysical logs, which have been uploaded to the FTP site. A conference call was held with AEP to discuss transferal of data collected at the Mountaineer Plant CO_2 injection site. Once acquired, these data will also be made available via the FTP.

WVGES has established a prototype website, secured with a Secure Socket Layer (SSL) encryption certificate. The site can be accessed at the following URL:

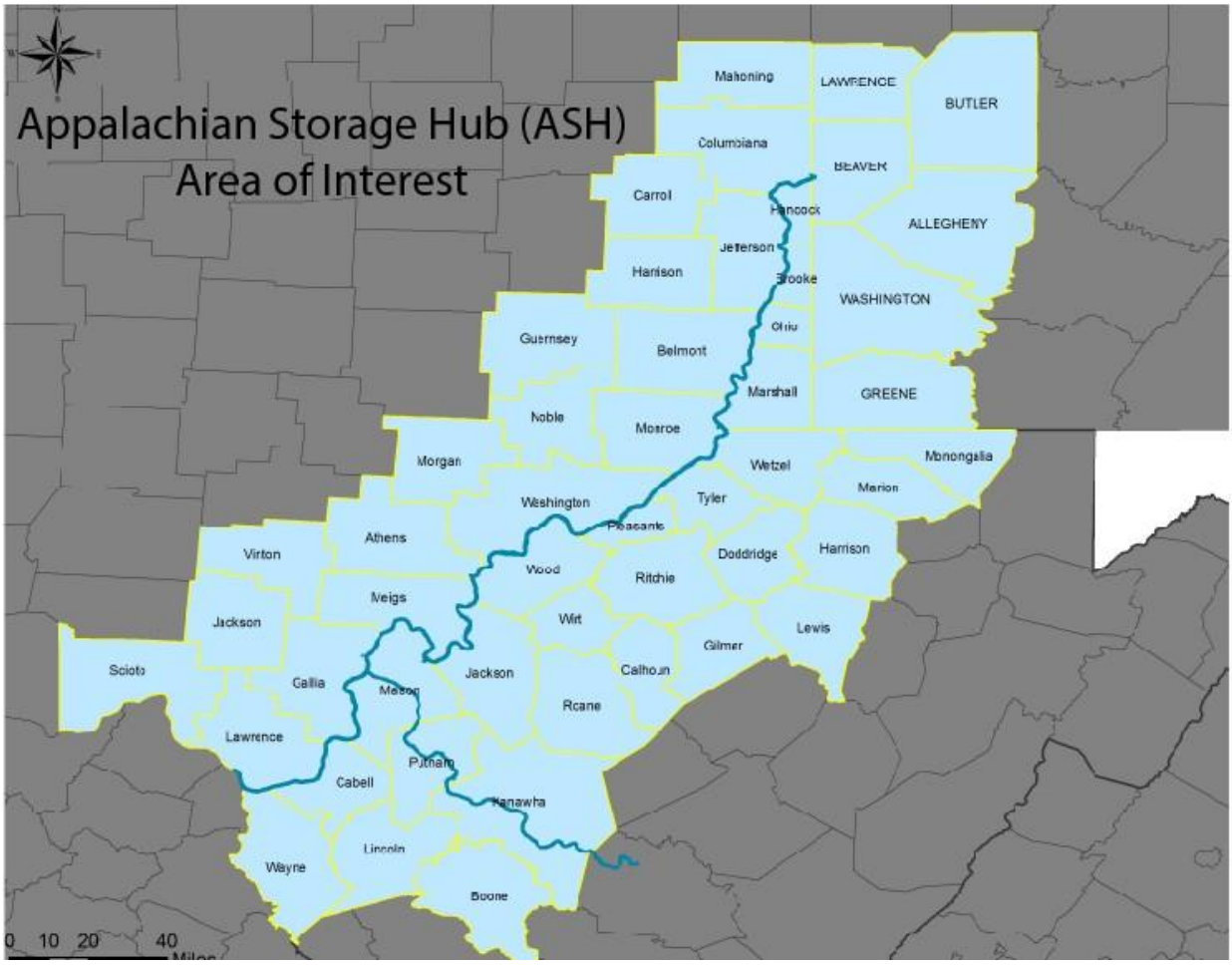
https://gisonline.wvgs.wvnet.edu/ASH

Email listservs have been established through the WVGES email provider, WVNet, and distributed to the Research Team. Please use the email listservs for communicating information to the team.

The listservs for Industry and Advisory members continue to be populated. The current Advisory Board includes the following individuals: Brian Anderson, Indrajit Bhattacharya, Peter Swift, Michael Goodman, Ray Boswell, Tom Eyermann, and Dennis Carulli.

2) Master PETRA Project

ODGS is building our master PETRA project, and Kyle Metz is now the point of contact for submitting state-specific data in the Area of Interest (AOI). The AOI has been slightly modified to include several more counties in central West Virginia (see graphic below).



Kyle requested that states submit their well header, formation tops, and digital log data using PETRA .PPF files. The sooner ODGS receives these data, the better. The group agreed that much of the subsurface data for this project will be derived from our Utica Shale Consortium work and ongoing Midwest Regional Carbon Sequestration Project (MRCSP) geologic characterization mapping, so it is mostly a data review and compilation task. PAGS indicated that the Greenbrier Limestone interval will likely be the last dataset it shares with ODGS.

PAGS has finalized the stratigraphic correlation diagram for the project and has uploaded it to the ftp site.

3) Project Schedule and Revised Milestones

Doug summarized the revised project schedule, which condenses our work into a 12-month period (August 2016 - July 2017). See table below. Given this schedule, Strategy 1 – Data Collection, was to be completed by September 30, with Strategy 2 – Stratigraphic Correlation of Key Units, beginning this month. Kris commented that these two strategies bleed together a bit, with data still being reviewed and submitted to ODGS.

Appalachian Basin Storage (ASH) Study		
Strategies/Activities	Start Date	End Date
Strategy 1: Data Collection		
• Identify and assemble well log and core data	Month 1	Month 2
• Identify previous studies of interest	Month 1	Month 2
• Create a project database (format, prototype)	Month 1	Month 2
Strategy 2: Stratigraphic correlation of key units		
• Develop cross sections of the Salina Formation	Month 3	Month 8
• Develop cross sections of the Greenbrier Formation	Month 3	Month 8
• Develop cross sections of the Keener to Berea Interval	Month 3	Month 8
• Develop cross sections of the Upper Devonian Sandstones	Month 3	Month 8
• Develop cross sections of the Oriskany Sandstone	Month 3	Month 8
• Develop cross sections of the Clinton-Medina through Tuscarora Interval	Month 3	Month 8
• Develop cross sections of the Rose Run and Upper Sandy Member of the Gatesburg Formation	Month 3	Month 8
Strategy 3: Map the thickness, extent, and structure of potential storage units in the study area		
• Map the Salina Formation	Month 5	Month 7
• Map the Greenbrier Limestone	Month 5	Month 7
• Map the Keener-Berea, Upper Devonian, Oriskany, Clinton-Medina, and Gatesburg Formations	Month 5	Month 7
Strategy 4: Conduct studies of reservoir character		
• Characterize potential storage intervals in the Salina Formation	Month 5	Month 8
• Characterize potential storage intervals in the Greenbrier Formation	Month 5	Month 8
• Characterize potential storage pools in gas-depleted sandstone reservoirs	Month 5	Month 8
Strategy 5: Develop ranking criteria for potential storage zones		
• Determine criteria and weighted priority of potential storage zones	Month 8	Month 9
Strategy 6: Recommendations		
• Rank all candidates within each category	Month 10	Month 11
• Rank the top candidates in each category	Month 10	Month 11
Strategy 7: Suggestions for engineering follow-up study		
• Make suggestions for additional field and lab studies	Month 10	Month 11
Strategy 8: Project management and technology transfer		
• Project management	Month 1	Month 12
• Final Report	Month 11	Month 12
• Technology transfer		Month 12+ ongoing

Doug indicated that our monthly teleconferences serve as 'monthly reporting' so there is no need to provide him with written reports on a monthly basis. However, our first quarterly report (covering August – October) will be due on or about November 11; use the "quarterly progress report template" in your project agreement to complete this report.

The next Partners meeting will be held in February 2017 at a venue to be determined. Doug suggested Southpointe (Canonsburg, PA) as a potential location.

Next meeting date – Wednesday, November 9, 2016, at 10 am.

4) Action Items and Next Steps

Kris – meeting minutes

Jessica – firm up listservs for Industry and Advisory Board members

Michele – code project data by type and play

ALL – send invoices to Doug, send data to Kyle, prepare for quarterly reporting