

**Agenda
South River Science Team
February 8, 2005**

DEQ Office
Harrisonburg, VA

9:00	Welcome, Introductions	Don Kain
9:15	DuPont Stormwater Update	Mike Sherrier
9:45	Final Summary of Va. Tech Fish Food Habits Study	Don Orth
10:15	Break	
10:30	Update / Status on Clam Studies	Doug Graber-Neufeld
10:45	Shake & Bake Update	Rob Mason (by phone)
11:15	Floodplain results	Dick Jensen / Annette Guiseppi-Elie
12:00	Lunch	
1:00	Communications / Newsletter / Mercury Brochure / Signs / Publications & presentations (SETAC)	Ralph / Don
1:30	Other topics, updates, etc.	All
2:00	Hypotheses / What we know and what we don't know	Ralph, Don, All
2:30	Agenda / Details for November Expert Panel Meeting (Nov 9 & 10, 2004)	All
	Adjourn	

toll free call in number: 866 249-5325, participant code 230874.

- Database project – goals, team, etc. – Mike Sherrier
- Demo of digitized aerial photos, maps, specific sites – Joel Hennessey
- Plant Site Phase II RFI Investigation - Mike Sherrier
- Update of recent river geomorphology survey - Jim Pizzuto
- Status of TMDL - Robert Brent / Jack Eggleston
- Status of 3rd party interactions (NRDC) - Ralph Stahl / Mike Liberati
- Surface water results - Dick Jensen / Ralph Turner
- Bird studies - Dan Cristol
- Fall garden study results - Bill Berti/ Dean Cocking
- Angler survey - Steve Reeser
- Advisory signs, public outreach, brochure - Don Kain / Ralph Stahl.
- Newsletter - Mike Liberati
- Clam study update - Tom Benzing
- Stormwater sampling - Mike Sherrier
- Periphyton of the South River Watershed, Virginia: Mercury Accumulation, Bioavailability and Possible Transformation - Mike Newman
- Review of 2005 field studies - proposed and planned - group discussion.
[folks should come with a list of their items so we can develop a “master” list

Meeting Summary

Introductions. Don Kain

Self-introductions were made by all. Minutes from previous meeting and CD of all meeting summaries were provided.

NRDC/Sierra Club vs. DuPont Litigation. Mike Liberati, Ralph Stahl

- Final decision still pending. May have more information by next meeting in April

Update of recent river geomorphology survey. Katie Skalak, Jim Pizzuto

- Mapped South River segment; see map in Presentation folder
- Seems to be two morphologically different segments; from DuPont to Forestry Center, then from Forestry Center to Port Republic
- Higher gradient in downstream segment; more bedrock controlling stream channel and anastomosing reaches
- Not much Hg storage in alluvial fans
- More likely to have high Hg storage in upstream segments
- Jim thinks that bank erosion is fairly localized, rate probably controlled by reach curvature and vegetation; can be modeled. Erosional areas are easy to find, few, and probably predictable
- Can figure loading from banks once we have rate and profile identified
- The bank to north of Genicom may be a good source
- Future work: continue mapping, characterize bank profiles, get EPA aerial photos
- Measure bed and bank storage
- Sediment dynamics- nail down transport mechanisms
- Hydrologic model may not be useful, depends on storage in the bed
- Tom Benzing asked if Jim had checked out the oxbow – “yes wandered around there for ~2 hrs., think it’s nice storage area for fine grains, but have to be careful when you sample it (because it’s been disturbed? Ed)
- Not currently planning to do a lot in the ox-bow, but could change depending on results of concurrent studies

- Bob Luce- thinks clays may be more important particle for study; Jim –“no, because there’s still Hg in the system, thinks we need to be more concerned w/ silt (this means that clay loss in the guzzler method would be less critical)
- Ralph Turner suggested that we ID natural vs. art. features of the stream reaches, which will tell us where to look and where not to look for Hg
- Question about whether we’re permitted to bank sample w/out securing owner permission; general consensus that most owners grant permission readily, and that it doesn’t take too long to get permission

Plant Site Phase II RFI Investigation. Mike Sherrier

- NE corner of plant is of interest, since it’s downgradient of the old Hg retort area
- Also interested in downgradient of incineration area- found buried incineration pit, w/ Hg in the soil underneath it (might be the anecdotal “concrete tub” of Hg that Dean Cocking mentioned)
- At the Hg retort area, used a soil-gas meter to search for Hg, also searched at former Chemical Building
- In all areas where free Hg has been found, have put in additional wells and performed soil gas Hg monitoring
- Wherever elemental Hg is observed during any activities, a strict SOP is in place to direct subsequent remediation efforts
- Have looked to see if any additional buried incineration pits can be found in incinerator area
- found 1 area near chemical building where there’s still some Hg
- Found no additional Hg in the previously identified incineration area; that area is about 30’ sq., and Hg is “tightly constrained” in that area
- There’s a natural subsurface “basin” beneath the retort pit that shallow aquifers drain into (see presentation figure)
- someone asked where Lithia Springs went- “no idea; don’t know if wells are draining it”
- Jim Pizzuto- if the basin is under stream level, where’s the water going? “that’s the million dollar question”
- Robert Brent- maybe do dye trace study to see if there’s a downstream connection? “maybe; but might be able to trace Hg directly”

- SWMU downgradient has Hg total at 44,000 ng/L, Hg probably moving in; where does water from that well go (it's a deep well)?
- TSS from above was low, probably supports that Hg in the well is legacy, not current transport
- Found Hg at 10 µg/L downgradient of WWTP; very high, but the well is new (sometimes seems to result in very high initial total Hg in samples; we'll see as well ages) water from this well is around 5-20' below ground level
- In the production wells, total Hg runs around 1-16 ng/L, dissolved around 1-8 ng/L; is this low enough to be natural? Ralph Turner thinks it's not *too* high to be natural...
- Don't know where all the above Hg ends up... there's subsurface utilities, 001 drainage, etc.

Stormwater Sampling. Mike Sherrier

- Want to find if Hg from outfalls is bioavailable; currently using dissolved Hg as surrogate for bioavailability
- Have checked in sewer manholes within plant for visible mercury (found some)
- Presentation has details of study plan; can be found in Presentations folder
- outfalls 2,7, and 9 don't have stormwater flow, . not sampling stormwater for those
- Currently have some baseflow results
- total Hg going into South River during first baseflow study was 0.76 g/day
- 2nd baseflow results were 0.349 g/day loading to South River
- 3rd baseflow was 0.42 g/day
- Note that 011 doesn't go directly to river, although loading within 011 was 2g/day, it goes to treatment, Hg removed along w/ sludge
- More free Hg in Chemical Building drains, more in 011 than expected
- Found sediment near Chemical Building that was around 1000 ppm Hg
- Future work will include cleaning up Hg in chemical building (and investigating what's going on in 011?)

TMDL. Robert Brent, Jack Eggleston

- Want to maintain good communication between TMDL, SRST (no redundant efforts)
- Concentrate on MeHg/Hg cycling
- Will work to determine mass balance MeHg/Hg
- Try to determine if MeHg sorbed to sediments is bioavailable
- Continue water quality monitoring at Doods, Harriston, Waynesboro, will have nearly real time data that can be downloaded from web site
- Collect more flood data (like Jeanne) over the next 3 years

Surface Water Results. Ralph Turner, Dick Jensen

- Performed close interval work from Constitution Park to Doods
- Also wanted to determine correlation between headspace Hg vapor to soil/sed. Hg, to use Lumex in the future
- For close interval work, repeated the August run, to see what MeHg was like under cold weather conditions
- Collected soil from ~100' south of Genicom ditch to use for headspace experiment (want Jim Pizzuto to look at the feature to see if it's depositional, natural, etc.)
- Expected that during a flood, dissolved Hg would be diluted out, but that's not what seems to be occurring in South River
- For winter, got relatively high MeHg results (don't expect bacterial methylation at near-0°C conditions)
- Want to know how dissolved Hg is staying high during high flow
- Sample variability is probably not analytical variability, but sample heterogeneity
- Hg converted to MeHg at about the same rate (winter vs summer?); what kind of mechanism could account for it?
- Future work – develop manipulative tests, generate hypotheses

- Jack Eggleston to Rob Mason- if you add sed. Hg, how much/how long till diss. Hg goes up? “doesn’t go up that much” from sediment, but soils may be different (see previous R.Turner/D. Jensen report)

- Ralph T. thinks we’re seeing desorption of previously methylated Hg (from summer?) that’s got winter MeHg remaining at relatively high levels

Clam Study. Tom Benzing

- In the Parks reach (North Park to Basic Park), cages at 100 m intervals

- 100 m intervals also at Genicom to Dooms reach (covers interval in which originally observed clam Hg jump)

- Nice slide of consecutive floods, Francis, Ivan, Jeanne; explains why study was ended prematurely; still, had good cage retrieval and clam survival

- Is there a bump in MeHg in clams downstream of the STP? Maybe, maybe not

- SD for samples is pretty tight

- Clams at DuPont reach from earlier portion of study not much different from “Parks” reach (except different proportion of MeHg to Tot. Hg?), except once you get past oxbow, jumps up a fair bit

- At Dooms millpond, Hg is high, and is all due to MeHg

- Dick J.- do the two reaches extrapolate into each other (rough estimate from the two slides is that there may be a linear increase w/ distance downstream from the beginning of the “Parks” reach to Dooms) “Haven’t checked that yet”

- Ralph T. asked Tom to pinpoint where the original 2002 clam data indicated the increase in the bend area prior to Dooms

- Dan Cristol asked if clams accumulated differently in areas where they don’t naturally occur – “growth data suggests that they filter similarly even where they don’t naturally occur” (Doug Graber-Neufeld’s data); growth probably correlates pretty well w/ Hg accumulation)

- Tom was asked if he’s planning a lot of field work this summer; “would prefer to do more data assessment on previous work”

Database/Lunch. Mike Sherrier, Joel Hennessy

- Mike explained purpose, structure of the database; refer to Presentation folder

- Joel demonstrated GIS uses in conjunction w/ data base (similar to Water Window)

Bird Study. Dan Cristol

- DuPont will fund study, currently in the process of setting up nesting boxes
- will be monitoring reproductive success, health of fledglings; refer to Presentations folder
- Will also be checking to see if there's enough signs of kingfisher nests to incorporate into study
- Plenty of tree swallows (anecdotal accounts from property owners - swallows are preempting blue birds from their blue bird houses).
- Screech owl - will give info. on extent into terrestrial food web (primarily eating small rodents, insectivores, large insects)
- Also plan to check egg and feather Hg for other species (including Robins- almost exclusive vermivores)
- If enough data, may try to correlate Hg concentrations to reproductive success over entire range of contamination
- During field activities, need to look for 4" dia. holes near the tops of eroded banks, bridge embankments, etc. that might be kingfisher holes, then let Dan know locations

Periphyton of the South River Watershed, Virginia: Mercury Accumulation, Bioavailability and Possible Transformation. Mike Neuman

- Periphyton microhabitat represents a very dynamic system
- may form the bottom of the trophic transfer through the food web
- Could get transfer through grazers and scrapers, like snails, Heptageneids, etc.
- Light Isotopic Discrimination (N15) (use to trace Hg in food web?)
- See Tiered Study Description slide
- After data collected, develop manipulative experiments, grazers in lab on substrates w/ known MeHg concentrations
- Rob Mason – “might want to check to see if you've got SO₄²⁻ reducing bacteria

(through chlorophyll?)

- May use SEM/EDAX to measure Hg on diatom and surrounding surface
- Could use plates, but may influence methylation (unnatural surface, non-porous)

Proposal for an earthworm survey. Dean Cocking

- Would use sites ID'd through Hendricks '80 soil / sediment survey (refer to Presentations folder)
- Worms are the terrestrial equivalent of *Corbicula*, could be good indicator
- Did Greg Murphy get Lumbriculid data? Could be useful for Dean's study
- ~1.5 µg/g Hg in fresh wt. for worms at Hopeman Parkway
- See Study Objective slide
- Study could yield some insight into possible terrestrial methylation
- Suggest sample Hopeman, Forestry Center for study (have data on soil Hg concentrations)
- Rob Mason "need vertical data profile to correlate to worm data"
- See Budget slide
- Rob Mason "if Dan Cristol is looking at robins, then worm data might be pretty useful; would probably want worm and soil MeHg data"
- Ralph Turner – depurated worms have relatively high MeHg, but it's tough to figure what Hg value they're exposed to, . might want to perform lab study w/ controlled soil Hg concentrations; some researchers claim methylation may occur in earthworm gut
- Different worm spp. have different behavioral characteristics

Flux Chambers – status report. Rick Landis

- See chamber deployment slide in Presentations folder
- Have method for dealing w/ gravel bed (see slide), need to deploy in advance of taking measurement (up to 3 months)

- If take seepage measurements, have to be sure chamber is completely sealed at sediment interface; alternative is to use Mylar “balloon”, but you can’t have any backpressure or it overwhelms seepage pressure
- Propose May-June deployment
- Volunteers welcome (i.e., encouraged) contact Don, Mike L., Ralph Stahl if available
- Want to use 6 locations in depositional, backwaters, ox-bow, dooms mill pond and race, periphyton ponds
- Jack Eggleston-“using any blanks?” Ralph Turner –“if you’re measuring MeHg, there’s not much chance of getting MeHg contamination” so blanks less critical
- Ralph Turner – there’s so much disturbance using chambers, not sure how useful data will be, or how to interpret it
- Chambers can go for 30 days on a battery charge (just make sure they’re removed before any major storm events; the things are expensive)

Newsletter, etc. Mike Liberati

- Plan to discuss NRDC/Sierra club matters once all is finalized
- Office will be opened in Waynesboro, old Red Cross building with front 1/3 as public/outreach area; back 2/3 for research activities/operations
- Safety issues- DuPont “safest” Co. to work for; will be developing safety protocols for contractors, employees, etc. to use in field

Data Gaps/What we know. Ralph Stahl, et al.

- See .XLS slide for duration, timing of projects
- Think maybe one more season of garden work at Forestry Center

Tentative Meeting Dates for 2005.

Tues., April 12

Tues., June 7

Tues., Aug 9

Tues., Wed., Oct. 18, 19 Expert Panel Mtg.

Tues., Dec. 13