To: DeMeo, Sharon M.[Demeo.Sharon@epa.gov]
From: Mike Marlett
Sent: Fri 1/24/2014 10:15:40 PM
Subject: RE: Questions regarding Italian VCE systems

Typical purity of the FGD distillate is 30 PPM of non volatile TDS. The steam electric guidelines addresses NO_3, As, Se and Hg. These are essentially non-volatile at the temperatures we operate at and should not be seen in the FGD distillate in detectable quantities. Regarding any pollutants from the leachate, I would think that the pollutants in the leachate would come from the ash and not from the FGD distillate for the reasons above.

Regarding the wording of the document referenced, I would say the wording is poor and inaccurate. I also think that we should look at the entire plant and would stand by my position that if the process does not discharge directly to the environment, require a discharge to the environment or its reuse does not directly cause a discharge to the environment that could be avoided by use of a different water source, the process is ZLD. I would change the wording to reflect that viewpoint.

I think wording as you referenced encourages approaches to meet a definition opposed to meeting the intent and more beneficial to the environment.

Mike Marlett

P: 262+369-4039

email: marlettm@aquatech.com

From: DeMeo, Sharon M. [mailto:Demeo.Sharon@epa.gov]
Sent: Friday, January 24, 2014 3:26 PM
To: Mike Marlett
Subject: RE: Questions regarding Italian VCE systems

Hi Mike,

Thank you for providing the information that I requested, as well as your thoughts on the subject. I understand the point you are making. Presumably, if high quality distillate is used as boiler make-up water, the blowdown might have little to no traceable amount of the pollutants

originally removed from the FGD process. (I wonder if the boiler blowdown could perhaps be reused in the FGD) However, if concentrated brine solution is used for ash conditioning, would you not potentially see the pollutants from the brine solution in the leachate of an on-site landfill? This is an interesting technical issue that may require further evaluation.

In addition, the phrase "truly zero discharge" came from the Technical Development Document of the recently proposed Steam Electric Effluent Guidelines, page 7-14:

"The condensed vapor (i.e., distillate water) can be recycled back to the FGD process, used in other plant operations (e.g., boiler make-up water), or discharged. If the plant uses the distillate for other plant operations that generate a discharge stream (e.g., used as boiler make-up and ultimately discharged as boiler blowdown), then the FGD process/wastewater treatment system is not truly zero discharge. Therefore, operating a vapor-compression evaporation system does not guarantee that the FGD process/wastewater treatment system achieves zero discharge."

Thanks again for the discussion.

Sharon DeMeo

US EPA – Region 1

Phone: 617-918-1995

Fax: 617-918-0995

From: Mike Marlett [mailto:MarlettM@aquatech.com]
Sent: Thursday, January 23, 2014 6:35 PM
To: DeMeo, Sharon M.
Subject: RE: Questions regarding Italian VCE systems

Sharon,

Based on my information, the two Italian plants that are not running are Fusina and Sulcis. Fusina is not running due to commercial contracts they have in place. Sulcis is not running because they are not generating any feed water.

The project profile only covers the process of FGD WW evaporation and not the entire power plant. For the FGD process, if the distillate is reused within the plant and the only discharge is a solid off site, there is no liquid discharge beyond the plant boundaries from the FGD process. Therefore, the FGD process is ZLD. We do not say the entire plant is ZLD since we have not provided the treatment equipment for the entire plant. It is a proven practice that boiler blowdown can be treated in a ZLD process.

Based on my understanding of your correspondence,

Scenario 1

FGD evaporator distillate is not discharged beyond the boundary.

Distillate is used in the scrubber.

Boiler blowdown is discharged and landfill leachate is produced.

Therefore, the FGD process is ZLD.

Scenario 2

FGD evaporator distillate is not discharged beyond the boundary.

Distillate is used in the boiler or for ash conditioning.

Boiler blowdown is discharged and landfill leachate is produced.

Therefore, the FGD process is not ZLD.

There is no difference in the blowdown from the **plant** in either scenario 1 or 2. Your scenarios suggest playing a shell game where, if we reuse the water for one purpose in the plant, the process is ZLD but if we use it in another place, it isn't, despite the fact the liquid discharges from the other processes would still be there regardless of the source of water for those discharges. My definition of process ZLD is that the water produced is suitable for reuse within the plant and no liquid is directly discharged from the process outside of the plant boundary. In both scenarios, no liquid is discharged from the FGD evaporation process beyond the plant boundary. Whether the plant chooses to achieve full ZLD in the plant from all sources or not does not invalidate a statement that a **process** is ZLD provided the water is completely reused within the plant and no water from that process is directly discharged beyond the plant

boundary. In my opinion, how the water is reused within the plant does not determine whether the process is ZLD or not.

I stand by the Aquatech Profile. The FGD evaporation process is ZLD.

Is the use of FGD evaporator distillate for use as boiler makeup or ash conditioning the direct cause of boiler blowdown discharges or landfill leachate? No. If evaporator distillate were not used, would another water source for boiler makeup and ash conditioning be required? Yes

From my standpoint the reuse of evaporator distillate is beneficial since it reduces the load on the water supply by reusing water and reduces treatment chemicals because the water being reused has a higher quality than the other sources of water that might be used.

Regarding the EU regulations for discharges, it would be best if you contacted them regarding what is permissible. I'm not knowledgeable on what is permitted.

J. Michael Marlett, P.E, P Eng

Aqua-chem ICD Division
Aquatech International Corporation

From Innovation **Flows Leadership**

1150 James Drive
Hartland, WI 53029
P) 262-369-4039
F) 262-369-9494
e-mail marlettm@aquatech.com

From: DeMeo, Sharon M. [mailto:Demeo.Sharon@epa.gov]
Sent: Thursday, January 23, 2014 12:34 PM
To: Mike Marlett
Subject: Questions regarding Italian VCE systems

Hi Michael,

Thanks for chatting with me a couple weeks ago about VCE technology. You had mentioned that Aquatech had installed five systems in Italy. According to the literature, the five facilities are Fusina Power Plant, Torrevaldaliga Nord Power Plant, Sulcis Power Plant, La Spezia plant and Brindisi Sud Power Plant. You also explained that only three of the five plants are currently operating. Would you please tell me which two are not operating and confirm that they had determined off-site disposal was more economical?

In addition, each of the Aquatech Project Profiles for these facilities indicate that ZLD systems were installed and that "[t]he industrial grade soft water and high purity distillate produced in the system will be used in the main power plant." My understanding is that if VCE water is reused back to the scrubber than the system is truly ZLD. On the other hand, if the water, for example is used for boiler make up or ash conditioning, these operations generate boiler blowdown and landfill leachate. Therefore, it is not a complete ZLD system. The Profiles also explain that "[w]astewaters from FGD treatment plant can no longer be discharged into the sea due to tough Italian and EU environmental regulations," but are other wastewaters allowed to be discharged from these plants?

Any information you can share or point me towards is greatly appreciated.

Regards,

Sharon

Sharon DeMeo

US EPA – Region 1

Phone: 617-918-1995

Fax: 617-918-0995

DISCLAIMER: The information contained in this email and in any attachments is intended only for the person or entity to which it is addressed and may contain confidential and/or proprietary material. Any review, retransmission, dissemination or other use of, or taking of any action in reliance upon, this information by persons or entities other than the intended recipient is prohibited. The recipient should check this email and any attachments for the presence of viruses. Sender accepts no liability for any damages caused by any virus transmitted by this email. If you have received this email in error, please notify us immediately by replying to the message and delete the email from your computer. This e-mail is and any response to it will be unencrypted and, therefore, potentially unsecured. Thank you.

********** ATTACHMENT NOT DELIVERED ********** This Email message contained an attachment named image001.jpg which may be a computer program. This attached computer program could contain a computer virus which could cause harm to EPA's computers, network, and data. The attachment has been deleted. This was done to limit the distribution of computer viruses introduced into the EPA network. EPA is deleting all computer program attachments sent from the Internet into the agency via Email. If the message sender is known and the attachment was legitimate, you should contact the sender and request that they rename the file name extension and resend the Email with the renamed attachment. After receiving the revised Email, containing the renamed attachment, you can rename the file extension to its correct name. For further information, please contact the EPA Call Center at (866) 411-4EPA (4372). The TDD number is (866) 489-4900.
********** ATTACHMENT NOT DELIVERED **********