



Meeting of the CCS/BCS Technical Advisory Committee

Minutes

Wednesday 8th June 2022

Online

Chair: Stephen Nortcliff

Attendees:

Georgia Phetmanh REAL
Thomas Aspray REAL
Emma Laws REAL

Jo ChapmanBCS Operators' RepresentativeGregor KeenanCCS Producers' Representative

Roy Lawford OF&G
Nicholas John ACL
Sophie Arguile NSF

Sarah Pitcher Laboratories' Representative

Fiona Donaldson **SEPA** Kathy Nicholls EΑ **Richard Fairweather** EΑ Lara Moggridge NRW Colin Millar NIEA Elizabeth Cooper **DEFRA** Vilma Cortes **DEFRA** Stephen Brockhurst **UKAS** Simon Thorpe **Red Tractor**

Welcome, apologies and introductions

SN welcomed all attendees and gave apologies from all those who were unable to attend (Alison McKinnie and Philippa Arnold). SN then initiated a roundtable of introductions.

Minutes and actions from the last meeting

GP delivered an update on actions from the previous meeting in November, as well as the March catch up telecon.

November meeting

REAL to consider advice from TAC regarding labelling requirements in the EU FPR to resolve the issues related to third-party compost suppliers (GP)

GP reported that this action is ongoing; REAL are currently revising the scheme rules and are considering developing a labelling/approval scheme with requirements for third parties e.g., bagging

companies, managed by REAL in a similar way to how other schemes operate e.g., Red Tractor and Organic schemes. This has been discussed with the certification bodies. Additionally, we have been engaging with DEFRA and discussed how labelling might work under the FPR. This is all still under consideration and a fuller update will be given at a future TAC meeting.

OF&G to consider comments from the EA regarding odour complaint and a CCS site

Actioned. Both the EA inspectors and OF&G found no major issues at the site. OF&G carried out two spot inspections. The complaint investigation has concluded.

REAL to consider feedback from OF&G and the EA regarding CCS complaint

Actioned. REAL responded to the complainant informing that we would await the outcomes of inspections.

REAL to clarify rules/guidance concerning couriers in upcoming comms to producers

REAL issued a clarification note for labs and operators in December, which clarified both the requirements, and the guidance, on sample dispatch, courier service selection, and transit time.

REAL to consider comments from TAC regarding PAS 110 pasteurisation requirements in the context of seeding a digester with unpasteurised manure/slurry for next PAS 110 review

Actioned. These comments have been recorded, alongside those from BCS operators, for future review.

REAL to consider comments and advice from TAC on section in CCS Position on Technical Requirements related to dispatching non-conforming compost

This had been actioned. GP discussed this issue with KN, a clarification note has been added to the section with regard to applying for deployments. This document will be sent out once any other comments from the EA have been received and addressed.

REAL to consider advice from TAC on technical guidance concerning RPS 241

The advice was to be cautious with the wording of the guidance. The draft versions are with the EA for comments before being disseminated to ensure they're accurate.

REAL to continue circulating summary paper going forward and reduce TAC meeting duration (GP) Actioned.

March telecon

TAC to share any additional comments or suggestions with Megan, the Research Hub Manager, on why we received no tender submissions for the PRT research project

EL reported that Megan had received no additional feedback from TAC but has collated a lot of feedback from various stakeholders. The PRT project will be covered by SN later.

REAL to consider comments and suggestions from the TAC on resolving the SEPA plastics issue long term and report back to the TAC the decision on a long-term solution

The comments and suggestions from the TAC have been discussed further internally and REAL agree that a more robust solution long term would be for the labs to assess and report against the SEPA limits. REAL have therefore reopened discussions with the labs on this issue and will discuss this in detail during a meeting with the labs at the end on the month. This development will be costly and time-consuming for both REAL and the labs, as new request forms and reporting templates will need to be implemented. REAL will report back on the final decision made.

REAL to check if dried digestate was discussed during ADQP revision T&FG meeting

Further processing of digestate was raised by the trade bodies in the December scoping meeting. A fuller QP update will be delivered by RF later in the meeting.

Simon to obtain more information from manufacturer on the Just Soil product and consider whether it would be beneficial for discussion with TAC members in June

This action is ongoing, ST will update at the next TAC meeting.

TAC to share thoughts with Georgia and Stephen on whether to hold longer TAC meetings face-to-face (in London and Edinburgh), online, or take a hybrid approach (in-person and virtual option)

The decision on this will be confirmed for the next meeting.

CCS & BCS updates

Scheme numbers

EL gave an update on the numbers on the scheme as of the end of May 2022.

CCS

- 175 certified processes
 - o 136 England
 - o 21 Scotland
 - o 11 Wales
 - o 6 Northern Ireland, and
 - o 1 in the Republic of Ireland
- ~4.0 million tonnes of input per annum
- ~1.8 million tonnes of output per annum
- 2 Applicants (since the start of 2022)
- 0 Suspensions
- 2 Withdrawals
 - Site closed
 - o Site no longer producing compost

BCS

- 99 certified processes
 - o 71 England
 - o 13 Scotland
 - o 8 Wales
 - o 7 Northern Ireland
- ~5.1 million tonnes of throughput
- 1 Applicant
- 0 Suspensions
- 0 Withdrawals

Opportunity to ask questions about updates in summary paper

There were no questions raised.

Update on the MDWG

EL delivered an update on the recent MDWG meeting:

The MDWG met in April 2022 for the first time since May 2021, as other meetings last year had been postponed into 2022 due to uncertainty over the QP revisions and delays to the Defra consultation on the implementation of the EU FPR.

The group discussed market changes over the last year, for example the increased value of digestate. David Tompkins from Aqua Enviro also attended to discuss recent projects he had been involved in, including a WRAP project on plastics in compost and digestate, which concluded in actions for the industry and government to take. David Tompkins also discussed his recent work for BEIS, and the information collated on digestate storage and covers.

One of the actions mentioned in David Tompkins' presentation was to extract the plastics data from REAL's database. The group agreed that this would be beneficial for market confidence and so put together a proposal to submit to the Research Hub; to gather evidence for potential future revisions to the plastic limits in PAS 100 and PAS 110.

This meeting was also Anna Becvar's final meeting as chair, REAL are working to find a new chair and are currently reviewing the Terms of Reference for the group.

KN queried if the project would be complete in time to be used for the QP review, as the EA would like to lower the plastic limit. SN responded that he could raise this at the Research Hub panel meeting and will contact the panel chair regarding options to fast track this project.

RL also commented that REAL should consider inviting David Tompkins to attend the TAC also, as while he worked at WRAP and attended his input was very valuable. KN agreed his input would be valuable.

 Action: TAC and REAL to further consider how they might involve David Tompkins to ensure his considerable knowledge of WRAP activities is made accessible to the TAC

Update on the Research Hub

SN first gave an update on the progress of the two projects selected for funding in 2021.

Firstly, the plant response test project tender invitation document was sent out in September 2021, however no responses were received. As such the Research Hub has been working on expanding its mailing list and reaching out to universities and other organisations. At the next Research Panel meeting, the panel will be considering the feedback collated on the Tender Invitation Document and proposal, as well as a new PRT related project put together by the PRT TWG.

The second project on the RBP test also went out for tender in autumn 2021, Aqua Enviro have been appointed and work has begun on this project.

The call for proposals ended in April and the Research Hub received four proposals, these were:

1. Development of approach(es) to compare the performance of BCS/CCS approved laboratories for scheme specific test methods

Submitted on behalf of CCS and BCS.

Scope: To develop standardised laboratory performance assessments for scheme-specific test methods (for both BCS and CCS).

Purpose: To ensure consistency in scheme-specific test results across laboratories, thereby reinforcing the Schemes and increasing operator, regulator, and end user confidence in scheme-specific test results.

Relevant to BCS and CCS

2. Extract and analyse REAL data on physical contaminants in composts and digestates to help inform new limits in future revisions of PAS100 and PAS110

Submitted on behalf of REAL's Market Development Working Group.

Scope: To analyse REAL's data on physical contamination in compost and digestate and research the feasibility and benefits of adopting an area-based method for quantifying plastic film in compost and digestate samples.

Purpose: To reinforce the Schemes and related Standards by generating evidence to inform what reasonable limits might be introduced in future PAS100 and PAS110 revisions. It also serves to reinforce market confidence by ensuring that composts and digestates are of high quality, with physical contamination levels as low as reasonably practical.

Relevant to BCS and CCS

3. How the benefits of applying compost and digestate to soils can be accounted for under the Greenhouse Gas (GHG) protocol.

Submitted on behalf of an REA member

Scope: To research the carbon benefits of applying compost and digestates to soil and provide recommendations for how these should be measured under Scope 3 of the GHG protocol. (For context, Scope 3 of the GHG Protocol provides a framework for measuring the emissions associated with a given company's value chain but does not currently include guidance about accounting for the use of compost and digestate.)

Purpose: To allow operators to conduct carbon accounting and to promote the use of composts and digestates with end users.

Relevant to BCS and CCS

4. Mixing & Tank capacity assessments

Submitted by Matt Smyth (AquaEnviro)

Scope: To identify and investigate methods operators could use to assess tank capacity and mixing efficiency—factors which impact digestate stability and biogas production. Purpose: To provide operators a practical tool to assess tank capacity & mixing efficiency to optimise their systems for biogas/digestate production and minimise operational challenges associated with poor mixing (e.g., digester foaming, inhibition, and odour generation). Relevant to BCS only

SN then asked if there were any questions on Hub project proposals.

KN queried what plastics data SEPA have, and what the impact of the lowered limit has been? As this could link into the plastics project proposal. FD responded that SEPA do not have much more than REAL following the interference on their server.

KN also asked if the project could or would include distinguishing between compostable plastic and normal plastic in results. TA noted that for digestate in Scotland, there is some information in the 2nd Hub project. Secondly, TA commented that trying to separate compostable from noncompostable could be a part of that project rather than area analysis, as area analysis is timeconsuming and not necessarily more reliable than weight. SN raised that complaints in the field arise because of thin visible plastic, so area analysis would mean large thin pieces of plastic do not pass. GK added that the lower threshold in Scotland was introduced gradually, from a producers' perspective, it would be good for England to do this too if possible.

SN noted that the plastics project sounds like it could be useful for the QP revision, and that this is something the Research Hub's Panel could consider, should the project be fast tracked. SN suggested that he could speak to the Research Panel's chair to discuss this. REAL will also consider this further.

Action: REAL to consider fast-tracking plastic-related research project if selected

GK also raised that he has a video and pictures of plastics in the feedstock that he would like to share, while the issue is being discussed. GK then shared with the group images of the plastic content in incoming loads at his site in the morning, the contamination was at 2% by weight, but visually it looked to contain a very high amount of plastic (most plastic being carrier bags).

SA commented that it would be useful to work with local councils on understanding what contamination levels look like in practice, what evidence is there for setting the level at what is decided in contracts, and to consider how could councils and producers work together on contamination levels in incoming loads. KN agreed, adding that the EA have been discussing contamination with LAs. KN noted that in contracts, the level has historically been set at as 5% or 10% but there is a lack of evidence for why this level was decided on.

SA and KN suggested that some public outreach is needed to lower the contamination level from householders. Something could be featured in the Archers/Country File about where their waste goes, or the conversation could start in schools.

KN suggested that the EA will meet with LARAC, DEFRA, and the REA, and show them what 2% looks like and therefore what 10% would be, to try and create pressure on lowering the contamination level in contracts.

- Action: EA to consider sharing Gregor's video of plastic contamination with local authority representatives and discuss with trade bodies who is best to lead on reducing feedstock contamination
- Action: GK to circulate video of feedstock at Keenan Recycling with 2% plastic contamination

Update from the Certification Bodies

NJ reported that ACL had found the UKAS process really useful in making sure they were operating to a high standard. ACL had received no complaints and had no other updates since the catch up telecon in March.

SA began by introducing DR who will be working on CCS and BCS. SA also had no other updates and had no product complaints to report.

RL also had received no complaints since the last meeting. OF&G are in the process of training a new CO and inspectors, and they have their UKAS audit soon.

All CBs agreed that product complaints have been extremely rare in the last 6 months. The scheme rules now require that if a producer receives a complaint, they have to inform their CB, yet complaints are still low.

 Action: REAL to consider CB comments on lack of product complaints reported over the last several months

Update from the Approved Laboratories

SP reported that the audit round for the laboratories is about to start, and that the only recent change for the labs is the insertion of a statement on reports drawing attention to differing SEPA plastic limits.

Update from the CCS Producers' Representative

GK delivered an update on the last Producers' Forum, which was held as a hybrid meeting in early May.

Firstly, producers raised the issue of the level of contamination they must agree to accept to win LA contracts. Even when the level is low, the incoming load will be very contaminated.

Additionally, GK noted that there was some discussion on cost of dispatch due to changes in diesel, that while not under the scope of the scheme is creating challenges for dispatching compost to farms.

REAL had given an update on the QP which led to discussion at the Forum around oversize; some producers would like to see this accepted within the scheme, especially as a lower plastics limit is likely to exacerbate this problem. There was also consideration of potential comparators for compost; GK asked the TAC if they had any suggestions or thoughts on this, none were raised. Finally, producers had queries on the cost of the revision, which EL responded to by email after the forum.

• Action: TAC to share any thoughts on suitable alternative compost comparators to peat with REAL and GK

GK had given the Forum an update on the previous TAC meeting and in particular the response to producers' queries on the need for the *E. coli* test. ST had emphasised the importance of the E. coli test for food safety control, especially for crops that are not cooked before consumption. Red Tractor certified producers can use PAS 100 certified compost, but FYM has a 12-month exclusion period for fresh produce that doesn't need cooking before being eaten. This is for food safety control.

 Action: GK to feed back to producers Red Tractor scheme requirements for fresh produce in relation to the E. coli testing requirements, FYM exclusion period, and food safety control aspect

GK also reported that compostables had been discussed at the forum, with producers having differing experiences of compostables breaking down in their process.

Finally, GK commented on the REA's PAS 100 course and how beneficial it had been for his understanding of the scheme, raising that it should potentially be made mandatory for the PAS responsible person to go on this course at regular intervals.

SA added that on a different scheme she is involved with, sites must revalidate every 10 years, and that this is beneficial for ensuring the site keeps their procedures up to date. SA felt this may be something that could be applicable/useful for ensuring people understand their process and make changes if necessary.

Update from the BCS Operators' Representative

JC reported that similar to the point raised by GK on maintaining competence, BCS operators had been discussing at recent forums the need for a PAS responsible person in the way CCS requires.

 Action: REAL to consider comments from producer representatives on requiring routine attendance at PAS training courses, possibly every year or every number of years

The BCS forum meeting was also held as a hybrid meeting and was well attended compared to previous forums. JC noted that BCS forums do not seem to have as much active discussion as GK

reports from CCS, and that this is a longstanding pattern. It is hard to generate discussion, not yet having a chair appointed potentially contributed to this, but also the lack of a core group that regularly attends so may lack familiarity. Additionally, engagement may be low as AD operators are producing digestate as a by-product, so they may be less connected/invested in digestate. How to encourage discussion is something to discuss with the new chair when in place.

SN queried if before meetings there is any indication of what may be discussed, as this would allow for operators to prepare and may aid in increasing participation. JC confirmed that an agenda is sent out beforehand, as well as a scheme developments summary paper, and operators can share an issue with BCS representatives at any time if they would rather not raise the issues at the forum themselves.

 Action: REAL to consider with new Forum Chair how to involve new AD operators in discussions

JC then gave an overview of the key points of discussion at the meeting. Firstly, there was a query raised over the new form for RBP parallel or own inoculum testing. REAL clarified that a new code has to be requested and issued for each sample sent for testing.

JC mentioned there were a few items she would like to raise with GP in relation to the forum.

• Action: JC to contact GP regarding Forum follow-up with several AD operators

Operators at the forum expressed the difficulties they are currently facing with changes in permits and other compliance issues, this has taken up much of their attention and efforts recently.

Concern was raised by operators at the update from REAL on QP revision – specifically that the current position on manure-based digestate is likely to be withdrawn, operators were not aware of this. Manure-based digestate does not currently sit under the waste framework. If this changes, and it is brought under the QP, these sites would have to achieve PAS 110 certification to continue supplying non-waste digestate. JC added that these sites will not have been informed of this intention as the QP does not apply to them. They will not have been keeping up with the review and will be unaware of this.

KN clarified the EA's position on this: the current position is very out of date (2009), it is not up on the EA site anymore, they're unsure of the legal standing of this document, it has no clear status. The EA would like to bring manure-based digestate under the QP to regularise the position. KN does not know whether manure-based digestate would require certification. It would likely be less strict than other waste based digestate requirements, this is all to be discussed.

Technical Issues PTE Testing

TA delivered a summary of discussions so far around PTE testing of compost, as well as an update on REAL's current work in this area:

The issue was first raised at the CCS forum, as the lab(s) had misreported high PTE values. In response to this, REAL considered a process for being alerted to testing-related issues at the labs (from either the labs or producers). REAL identified no requirement in the T&Cs for labs to report issues directly to REAL. This was added to the T&Cs during the most recent revision, these T&Cs were consulted on and finally issued effective from Jan 22. REAL are monitoring for further issues.

GK then queried if it would be possible for the labs to re-test original sample at producers' expense at the March 2022 TAC teleconference, SP confirmed it is possible but out with of the scheme, the results will not be acceptable for certification. In the background, REAL has been carrying out PTE analysis internally to identify the failure rate. This analysis has highlighted potential areas of future work/future scheme projects. REAL are currently discussing typical / acceptable corrective actions with the CBs.

Molybdenum

TA explained that a query from a laboratory concerning Molybdenum (Mo) had brought the issue to REAL's attention; Mo appears on the reporting template but is not required under PAS 100.

Mo is a trace element for plants at low concentrations, but in high concentrations it is a PTE. It has historically not been included as a routine element in PAS 100 due to the cost of analysis for low level detection. However, Mo detection has improved with instrumentation development and improvements to the lab method.

REAL have some data on Mo; 33% of CCS processes have been tested for Mo and the range in test results is 0.4 to 22mg/kg dry matter.

Does the TAC consider that Mo should be included with the other trace elements in Table B1 in PAS 100, or be included in the PTE table?

SN asked if TA knew where the Mo was coming from. TA confirmed he wasn't certain but would suggest fossil fuel combustion services. SN asked if it is applied as a trace fertiliser or is it just assumed it is normally in an acceptable range. TA was unsure.

KN queried if the analysis REAL carried out was all on composted food waste. EL responded that she had not filtered for any specific process type or input and did not have a breakdown of this to hand. GK added that he had found online that Mo is found in food. KN explained that this why she had asked about inputs, as it might be in food waste but is it in depositions in green waste.

KN asked if anyone had information on the risk Mo could pose. GK suggested that David Tompkins may be able to shed some light on this, as for QMS he spent a lot of time looking at potential risks in compost.

SP noted that Mo is tested in soil as part of the Biosolids Assurance Scheme, on the voluntary list, so there will be some guidance from that on acceptable levels.

RL added that he had just looked it up and Mo is present in most soils and transferred in the diet the same way as Iodine. If a rich source is organs, it could be accumulative. KN agreed that if it is a bio accumulator, it could be a risk to human health and the EA will need to consider it. KN asked that REAL share these slides with the EA so that she can discuss the issue with Ian Martin.

- Action: REAL to consider advice from TAC on any future requirements for molybdenum testing under CCS
- Action: REAL to share TAC slides re molybdenum testing with KN to share with Ian Martin

Update on the QP revisions

RF delivered the following update on the ADQP and CQP revision:

Since last speaking to the TAC, the Task and Finish (T&F) Group has been set up, and the scoping meetings for each QP were held. The EA talked through the issues identified in the review: the plastics limit, and the risk assessment being out of date, then the EA opened to industry for topics

they wished to raise, for example additional waste inputs and new markets, and REAL raised the feedback from UKAS regarding auditability of requirements.

The EA have produced a cost estimate that has been distributed to the T&F group, who have responded with questions that RF will be going through and responding to over the coming weeks. Once costs are agreed, the revision will begin, and the T&F group will meet every month for 6 months.

SN asked RF if the proposed Research Hub project on plastics would be useful for the QP revision, and if the existing Hub year long timeframe would not provide information in time for the QP revision. RF confirmed that it would be better if this work was available to them sooner.

JC asked when the operators who had pledged funding would be chased for this. RF responded that everything will be charged in arrears over the six months. Operator pledges were made to trade bodies, so it will be these organisations that contact operators for funding.

Update on the GB FPR

EC from the Defra fertilisers team gave an update on the progress made on the on the Fertilising Product Regulations. EC informed that currently, they are reviewing the current domestic fertilising regulations, and how retained articles of the EU FPR could be used as a new framework.

Defra did some engagement last year, including with Paul Thompson representing REAL, but further work on this has been delayed due to workload. The QP reviews will inform this work and Defra had agreed to contribute some funding towards the QP review.

KN noted that in past discussions with Defra, it has been discussed that domestic legislation would refer to the standards that already are in existence. The aim is for the FPR to reinforce this, not duplicate it.

JC asked about public consultation, how might this fit around the timings of the QP revision. EC confirmed that consultation would not be held until after the QP revision, it will not be ready in the short term.

SN asked how different the GB FPR would be from the EU FPR. EC responded that they do not have the detail yet, they need to conduct more analysis. EC asked that if anyone has any information on how well the EU FPR is operating when fully operable in Europe next month, that they share this.

EC also commented on the earlier discussion on manure fed digestate plants; under the EU FPR there are only two categories of digestate: crop fed, and non-crop fed, so where manure based digestate lies is a question to be considered.

Action: TAC to share any thoughts on the EU FPR with LC at Defra

AOB

GP informed that REAL have been working on a project to compare the costs of upfront fees for validation testing and joining the schemes, to the mobile plant spreading permit. Just for our own understanding, are there other potential deterrents than cost? Other than, for example, that PAS 110 is too complex, that standards are impossible to reach, the need for a pasteuriser, etc.

FD responded that rather than a deterrent, potentially it is a reason to join that is lacking in England. In Scotland, local authorities are a big driver towards participation in the scheme; you will not get a LA contract unless the site is certified, as without certification it does not count to recycling.

NJ added that also the removal of template documents and the QP checker makes it harder for people to set up their documentation. RL commented that UKAS did not like the use of templates as they were too leading.

GP considered that perhaps REAL could provide further guidance documents rather than templates, and informed that the QP checker is being discussed with RF.

 Action: REAL to consider comments from the TAC on other drivers or deterrents to joining the schemes

KN raised that she had been in contact with the Defra Peat Team, regarding growing media made using Quality Compost. KN and Defra want to engage more with the growing media sector, CCS is a robust process but if there is something putting growers off, they need to communicate it. Defra had suggested that KN discuss this further with the trade bodies and REAL, as they may be able to gather feedback that the growing media sector are not so willing to share with the regulators. KN also suggested that the Defra Peat team be invited to the TAC, as they will be able to contribute to discussions on growing media.

• Action: REAL to consider inviting Defra peat team to TAC meetings

VC raised that more evidence is needed to support compost for use as a peat replacement, as nematodes and pathogens may cause problems for horticultural use. VC commented that there is not enough information on the composition of compost. KN responded that she was referring to certified quality compost only, so the composition of this compost is regularly tested and controlled. VC added that she had recently read a paper about a pathogen for potatoes found in compost. TA asked if VC could share this paper with him. KN also added that PAS 100 is faster and easier to adjust than the FPR, so in the case that requirements need adjusting for growing medium sector, this is very possible through the existing framework.

Action: VC to send paper on issues related to pathogens in compost to TA

Actions

- TAC and REAL to further consider how they might involve David Tompkins to ensure his considerable knowledge of WRAP activities is made accessible to the TAC
- REAL to consider fast-tracking plastic-related research project if selected
- EA to consider sharing Gregor's video of plastic contamination with local authority representatives and discuss with trade bodies who is best to lead on reducing feedstock contamination
- GK to circulate video of feedstock at Keenan Recycling with 2% plastic contamination
- REAL to consider CB comments on lack of product complaints reported over the last several months
- TAC to share any thoughts on suitable alternative compost comparators to peat with REAL and GK
- REAL to consider comments from producer representatives on requiring routine attendance at PAS training courses, possibly every year or every number of years
- GK to feed back to producers Red Tractor scheme requirements for fresh produce in relation to the E. coli testing requirements, FYM exclusion period, and food safety control aspect
- REAL to consider with new Forum Chair how to involve new AD operators in discussions
- JC to contact GP regarding Forum follow-up with several AD operators
- REAL to consider advice from TAC on any future requirements for molybdenum testing under CCS
- REAL to share TAC slides re molybdenum testing with KN to share with Ian Martin
- TAC to share any thoughts on the EU FPR with LC at Defra
- REAL to consider comments from the TAC on other drivers or deterrents to joining the schemes
- REAL to consider inviting Defra peat team to TAC meetings
- VC to send paper on issues related to pathogens in compost to TA