

VPA Permit VPA00076
Synagro Central LLC – Madison County
Summary of Public Comments and DEQ Staff Responses

1. Protection of Surface Waters

Comments were received related to concerns regarding adverse impacts to surface water quality:

- Potential for contamination from runoff into surface waters and the Chesapeake Bay;
- Adverse effects on fish and other aquatic life as a result of run-off;
- Proximity of the MA15 site to the Town of Orange Water Treatment Plant (WTP) intake;
- Negative impacts to recreational use of the Rapidan River due to runoff; and
- Need controls to eliminate non-point source discharges as they are more concerning than point source discharges.

Staff Response:

The conditions in the permit were written in accordance with Virginia Pollution Abatement (VPA) regulation ([9VAC25-32-30.A.](#)) to prohibit point source discharges of pollutants to surface waters, including wetlands, except in the case of a storm event greater than the 25-year, 24-hour storm.

The VPA regulation ([9VAC25-32-560](#)) requires the implementation of agricultural best management practices (BMPs) to reduce nonpoint source pollution from farmland. This includes restrictions on application timing, application rate, slope, and in particular, setback distances from sensitive environmental features. DEQ regulates stormwater from certain non-point agricultural sources (such as biosolids) by requiring these BMPs that reduce pollutant levels in the stormwater, rather than the point-source approach that sets specific pollutant limits. So just like stormwater from any other source, there may be pollutants present, but the permit conditions ensure that pollutant levels are minimized and downstream surface waters are protected.

Where impaired waters exist, the implementation of agricultural BMPs is the best method to reduce nonpoint source pollution from farmland in the subject watersheds. In most cases, these BMPs are implemented on a voluntary basis; however, agricultural land that receives biosolids is subject to regulatory requirements mandating key BMPs such as those previously mentioned. Thus, a farmer's choice to fertilize with biosolids increases the number of BMPs implemented as well as the regulatory scrutiny of the agricultural practices implemented on his or her farm.

The regulatory requirements specifically consider protection of public water supplies, and require a minimum setback of 100 feet between biosolids land application areas and surface waters designated as public water supplies. In the case of the MA15 site, at least 72 feet of the required 100 feet setback is a mixture of permanent vegetative cover and wooded riparian buffer. The Virginia Department of Health (VDH) has recommended that the setback distance for fields adjacent to the Rapidan River and closest to the Town of Orange water treatment plant intake be increased to 200 feet, and that notification be provided to Town of Orange officials, Town of Madison officials, and the Rapidan Service Authority when biosolids land application is to take place on fields adjacent to the Rapidan River and White Oak Run immediately upstream of the respective water treatment

plants. Synagro agreed to voluntarily implement the 200 foot setback on the subject fields at the site closest to the Town of Orange water treatment plant. Synagro did not agree to voluntarily implement the notification provisions recommended by VDH; however, DEQ staff has added a condition in the permit that reflects the additional notification provisions recommended by VDH.

2. Protection of Groundwater

Comments were received related to groundwater:

- Excess nutrients and contaminants migrating into ground water and drinking water wells.

Staff Response:

The conditions in the permit are based on requirements in the VPA regulations which were developed to ensure that neither infiltration nor runoff have an effect on groundwater. Planting and harvesting requirements are designed such that the plant root systems uptake nutrients. Runoff and infiltration are addressed through the assessment of field conditions, such as crop type, distance to groundwater, soil type, and topography. Additionally, the permit conditions include limitations on land application to sites with >15% slope and prohibit staging biosolids on sites characterized by the US Department of Agriculture Soil Survey as “Frequently Flooded.” The VPA regulation ([9VAC25-32-560.A.1.](#)) also requires that a Nutrient Management Plan (NMP) be written by a NMP writer certified by the Virginia Department of Conservation and Recreation (DCR), and that land application be conducted in accordance with the NMP. The NMP dictates rate and timing of application. NMPs are written to ensure that biosolids are land applied at a rate which is agronomically appropriate, and to prevent application of excess nutrients.

The VPA regulation ([9VAC25-32-560.B.3.e.\(1\)](#)) requires a 100’ setback distance from all wells located near land application sites. VDH regulation, ([12VAC5-630-380](#)) requires a minimum 100’ distance between new well construction and a “Sewage Disposal System or other contaminant source” including drain-fields, underground storage tanks, barnyards and hog lots. The VPA permit requirement for a 100’ setback from biosolids land application is a conservative application of this established standard, as agricultural fertilization of crops is not included in the VDH regulations as a contaminant source in this context and is not an activity that would require a mandatory setback for newly constructed wells. For wells that do not meet the VDH safe construction standards, the impact risk to a well is greater from more frequent and common activities surrounding the well than from land application activities undertaken observing appropriate regulatory setbacks, BMPs and other required protections.

Assistance for private well owners is available from the Virginia Household Water Quality Program administered by Virginia Cooperative Extension (<http://www.wellwater.bse.vt.edu/vahwqp.php>).

3. Biosolids Composition and Protection of Human Health and the Environment

Comments were received expressing concerns over the composition of biosolids as it relates to human health and the environment:

- Potential risks from unknown pathogens, metals and other contaminants;
- Air quality;

- Long term effects;
- Effectiveness of the treatment process;
- Monitoring frequency of biosolids;
- Every load of biosolids delivered to a site should be tested;
- Contamination of biosolids could occur during transport to the land application site;
- Self-monitoring is a conflict of interest;
- Application should only be allowed of Class A material as it is more treated;
- Class B biosolids require more stringent oversight;
- Class B cannot be used in urban areas but can in rural areas, thus showing disregard to rural citizens;
- The permit only regulates 9 heavy metals which falls short of all possible metals that could present;
- CPLR biosolids should not be allowed due to possible accumulation of metals;
- Large food companies not accepting products from land that has used biosolids;
- Some countries have banned the use of biosolids;
- University of Georgia study suggesting biosolids can impact health;
- Excess nutrient and contaminants entering the food chain;
- While it is considered safe today, further studies may reveal detrimental effects of biosolids;
- Risks are unknown;
- Lack of studies on some of the potential effects of substances and elements found to be in biosolids; and
- Concern that biosolids could contain harmful substances or elements that the scientific community has not determined to be harmful.

Staff Response:

The Virginia State Water Control Law ([§ 62.1-44.19:3.A.](#)) requires permits for the application of biosolids. The permit conditions contain all of the criteria required by the federal regulation plus additional requirements such as setbacks from homes and environmentally sensitive features, NMPs, public notification (including signage), financial assurances, local authority, inspections, and training. The combined state and federal restrictions, such as the federal access and harvesting restrictions and the state requirement for signage, work in concert to mitigate risk. Any person who land applies biosolids must obtain authorization to do so under a VPA permit and conduct all land application activity in conformance with that permit.

The VPA Permit Regulation ([9VAC25-32-675](#)) describes the differences in site management for Class A and Class B biosolids. Class B biosolids can be applied in urban areas; however, the access restriction is longer. Land application of Class B biosolids is allowed on public contact sites if specific access restrictions are followed, such as restricting public access for 1 year. Private farmland is considered to have a low potential for public exposure, thus the access restriction is shorter at 30 days.

The constituents in biosolids that the permit requires be monitored, and the frequency of that monitoring, is consistent with federal regulation ([40CFR Part 503](#)). Frequency is based on the amount of biosolids that is land applied from a particular source, and takes into account the expected consistency of the biosolids content. Sources of contamination from industrial sources is regulated through the implementation of pre-treatment programs that both protect the critical biological populations in advanced wastewater treatments plants as well as limit potentially harmful levels of pollutants in the solids removed from the wastewater. Contamination of biosolids during transport from the wastewater treatment plant to the land application site has not been identified as a likely source of pollutant limit exceedances. Monitoring by the permit holder is a primary

component of the regulations used to implement Clean Water Act requirements and is used extensively throughout all water permits.

The 2007 Virginia General Assembly ([HJ 694](#)) commissioned a group of experts to study the issues surrounding biosolids. The Biosolids Expert Panel (the Panel) published their final report as [House Document No. 27](#) in 2008. The Panel determined that as long as biosolids are applied in conformance with all state and federal laws and regulations, that there is no scientific evidence of any toxic effect to soil organisms, plants grown in treated soils, or to humans (via acute effects or bio-accumulation pathways) from inorganic trace elements (including heavy metals) found at the current concentrations in biosolids. DEQ and the State Water Control Board (SWCB) considered the Panel's review and recommendations when the VPA regulations were [amended in 2013](#). The Panel noted in its report that "while certain contaminants have been found in land-applied biosolids, mere presence will not in itself cause water quality impacts without a means to reach ground and surface waters. Additionally, presence does not indicate danger without a toxic concentration."

Research into the safety and use of biosolids as an agricultural soil amendment is ongoing. The Clean Water Act ([Section 405\(d\)\(2\)\(C\)](#)) requires the Environmental Protection Agency (EPA) to [review existing sewage sludge regulations](#) at least every two years. The purpose of the review is to identify additional pollutants that may be present in sewage sludge, and if appropriate to develop regulations for those pollutants. DEQ, along with VDH, monitor the progress of the research conducted by EPA in this regard, and if necessary, will respond to significant findings with recommendations to modify the VPA regulation. The [latest review](#) for which EPA has finalized results is 2011. The 2013 review is currently being evaluated by EPA management, and the review for 2015 is in progress.

During the summer of 2014, VDH performed a follow-up review of the VPA regulations in light of research that had been conducted since 2008. Consistent with earlier reviews, VDH's recent literature review did not find any contributory associations between biosolids exposure and adverse health effects. Until there is new relevant research to conclude otherwise, DEQ is confident that the VPA regulations and permits are protective of human health and the environment.

4. Livestock, Wildlife, and Unrestrained Domestic Animals

Comments were received concerning possible effects of biosolids applications to livestock and how wildlife and unrestrained domestic animals moving through land application sites may be affected.

Staff Response:

The VPA permit regulation ([9VAC25-32-675.B.5.e](#)) requires that livestock not graze on fields for a minimum of 30-days after Class B biosolids have been land applied.

The wildlife and domestic animal matter was considered by the Biosolids Expert Panel and no additional requirements were included in the VPA Regulation, as it was found that the limited exposure to wildlife poses no greater threat than normal agricultural activity. Additionally, the federal risk assessment did not find that wildlife posed a significant risk of pathogen transmission.

5. Landowner Consent

Comments were received questioning whether the landowners of the sites included in the permit application were aware of what they were receiving.

Staff Response:

Virginia law ([§ 62.1-44.19:3.A.3](#) of the Code of Virginia) requires that permit applications for land application of biosolids include the landowner's written consent to apply biosolids on his or her property. In signing the consent form, the landowner also attests that they have received a copy of the [DEQ Biosolids Fact Sheet](#). The Fact Sheet includes information regarding the origin of biosolids, different types of biosolids treatment, what testing is required, and ongoing EPA research on contaminants of emerging concern.

6. Odor

Comments were received expressing concern in regard to the odor associated with biosolids.

Staff Response:

The regulations do not prohibit odors. Biosolids, at times, can and do have objectionable odors. The type of treatment process and the climatic conditions during and after application can influence both odor and its intensity. DEQ encourages nearby residents to contact the agency at the number provided on the notification sign as soon as possible when odor issues are identified so that site-specific issues can be investigated and any patterns with sources, practices, or sites identified. The regulation does require the mitigation of odors [[9VAC25-32-60.F.1.c.\(3\)](#)] by both the wastewater plants generating biosolids and the land appliers.

Accordingly, the permit requires an Odor Control Plan with the following conditions:

- (a) Methods used to minimize odor in producing biosolids;
- (b) Methods used to identify malodorous biosolids before land application (at the generating facility);
- (c) Methods used to identify and abate malodorous biosolids if delivered to the field, prior to land application; and
- (d) Methods used to abate malodor from biosolids if land applied such as incorporation, if applicable.

The odor control plans will become an enforceable part of the permit, and may be reviewed over the course of the permit term for adequacy should site or source specific odor issues become repetitive.

7. Insufficient Laws, Regulations, and Permits

Comments were received addressing VPA laws, regulations, and draft permits and the lack of confidence that the permits encompass or thoroughly regulate all potential situations:

- Laws and regulations that are not protective of human health and the environment;
- Emerging contaminants not adequately researched or regulated; and
- Don't trust agency findings and verbal assurances.

Staff Response:

DEQ has processed the permit application and prepared a permit in accordance with the law and regulation as they exist. It is not DEQ's role in this permit process to assess the adequacy of the regulations. The permit is

an original issuance of a VPA permit. As part of the issuance process, and in accordance with the VPA regulation, adjacent landowners were notified, a public meeting was held, and public notice of the draft permit was completed.

The permit contains all of the criteria required by the state and federal regulations such as setbacks from homes and environmentally sensitive features, NMPs, public notification (including signage), financial assurances, local authority, inspections, and training.

The work of the 2008 Virginia Biosolids Expert Panel, the biennial reviews by the EPA, the technical advisory committee that advised DEQ on the regulations promulgated in 2013, and the VDH review in 2014 have all contributed to the existing regulatory requirements. In addition, the 2016 Virginia General Assembly passed [HJ120](#), which directs the [Joint Legislative Audit and Review Commission \(JLARC\)](#) to analyze scientific literature on the health effects of biosolids and industrial residuals, evaluate the feasibility of requiring municipal utilities that are currently permitted to generate "Class B" material to upgrade their facilities to generate "Class A" material, and undertake other analyses. This is a two-year study.

The permit includes a "reopener" clause, which would allow DEQ to make modifications to the permit before the expiration date, should any of JLARC's findings necessitate changes to State Water Control Law or the VPA Permit Regulation.

8. Property Values, Truck Traffic, and Quality of Life in Madison and Orange Counties

DEQ received comments that alleged that there would be a decrease in property values and a negative effect on the quality of life as a result of land application of biosolids:

- Financial implications due to biosolids applications on nearby properties;
- Financial and safety implications of large trucks on small roads;
- Decreased tourism due to the perception that Madison and Orange Counties are not stewards of their natural resources;
- Effect on quality of life as a result of decreased ability for recreational use of the Rapidan River and the outdoors;
- Decreased property value as a result of odors and contaminated streams; and
- Decreased outdoor recreational opportunities as a result of odors and contaminated streams.

Staff Response:

The impact of land application on property values was an inherent consideration during the development and adoption of the VPA regulation, and the regulation includes requirements specifically designed to protect the quality of surface waters and reduce the potential for odor impacts. The permit was prepared in accordance with the regulation.

In 2007, [HJ 694](#) required the Biosolids Expert Panel to respond to the question of whether odors from biosolids could affect property values or impact human health and well-being. The Panel's final report recognized that odors from biosolids could potentially impact property values, but could not confirm such an impact or the extent of such an impact based on the current body of scientific literature and information presented directly to the Panel. The Panel recommended that DEQ consider requiring that municipal biosolids generators be

required to have odor control plans to ensure that the generator is observing critical control points to minimize odors, thus reducing the potential that odor would impact adjacent properties. The permit includes a requirement for odor control plans from both the generators of the biosolids land applied as well as the land applier.

The permit requires that transport routes shall comply with all VDOT requirements and standards as specified in section [9VAC25-32-540](#) of the VPA Permit Regulation. The permit also specifies the operational requirements of vehicles that may be used to transport biosolids, as described in sections [9VAC25-32-420.A.](#) and [9VAC25-32-540](#) of the VPA Permit Regulation.

9. Background Water and Soils Monitoring

Comments were received related to water and soil monitoring:

- Requesting background testing on both surface and ground water near application site to establish baseline levels;
- Requesting background testing on soils at application sites;
- Requesting surface water, groundwater, and soils monitoring post-application, to include monitoring of wells adjacent to land application sites; and
- Biosolids applications contradict USDA-NRCS Soil Health initiative.

Staff Response:

Biosolids land application research that included extensive pre and post application monitoring of soils, stormwater runoff, and groundwater was used to design the BMPs prescribed in the permit so that ongoing testing would not be necessary. The extent of pre-application soils monitoring in the permit is based on the need of data to support the planning of appropriate land application rates. For metals, protective application rates are not dependent upon the concentration of metals in the soils, considering that the land application sites currently support agricultural use (i.e. if there were a soils problem that would cause environmental issues related to metals, that problem would likely be occluding agricultural productivity). For nutrients, the degree of pre-application monitoring in soils is based on the nutrient management regulations and standards and criteria. When permit conditions are followed, post-application monitoring of soils, surface water, and groundwater is not necessary. If non-compliance was suspected, DEQ would consider post application upgradient and downgradient monitoring as a mechanism to determine if any adverse environmental impact occurred.

DEQ is aware of the [USDA-NRCS Soil Health initiative](#). Biosolids land application is consistent with USDA-NRCS soil health goals in that it adds organic matter which can increase biological activity, improve soil structure, and increase water holding capacity which will increase infiltration and reduce surface water runoff. As discussed in the staff response to protection of human health and the environment, the Biosolids Expert Panel concluded that as long as biosolids are applied in conformance with all state and federal laws and regulations, that there is no scientific evidence of any toxic effect to soil organisms.

10. Permit Applicant's Compliance History

Comments were received questioning the compliance history of the permit applicant, Synagro, and responsibility for any damages.

Staff Response:

Synagro currently land applies biosolids in Madison County under an administratively continued VDH-BUR permit and has no compliance issues currently.

The permits allows Synagro to land apply biosolids in a manner that is protective of human health and the environment. Pursuant to Va. Code ([§ 62.1-44.22](#)), the fact that any owner holds or has held a permit issued by the Board shall not constitute a defense in any civil action involving private rights of adjacent or nearby property owners. In addition, as required by the Va. Code ([§ 62.1-44.19:3.H](#)) and the VPA regulations, Synagro maintains an environmental liability policy applicable to all their land application activity in Virginia, to pay claims for cleanup costs, personal injury, and property damage resulting from the transportation, storage, or land application of biosolids.

DEQ will perform inspections to ensure compliance with the permit and will initiate enforcement action, if applicable. Any injunctive relief and civil charges sought in an enforcement proceeding will be consistent with applicable law as well as DEQ enforcement guidelines and appropriate for the severity of the violation.

11. Documents Not Made Available for Review

Comments were received about the lack of a Biosolids Management Plan (BSMP), Operations & Maintenance (O&M) Manual, spill contingency plan, Odor Control Plan (OCP), and Nutrient Management Plan (NMP), and that these documents should be available for public comment prior to permit issuance.

Staff Response:

The permit requirements have been developed in accordance with the public involvement procedures specified in State Water Control Law and the VPA Permit Regulation. The permit requires that the permit holder submit the BSMP to DEQ within 90 days of issuance. Included in the BSMP are the O&M Manual and OCP. These documents allow the individual permit holder to provide specifics as to how they will comply with certain permit requirements. In developing the regulatory requirements, DEQ recognized that for some aspects of environmental or human health protection, *how* the outcome is achieved is not as significant as meeting the minimum permit requirement. These specific management practices may evolve over the term of the permit due to site or operational changes, as well as compliance determinations.

NMPs are site specific plans that the permit holder must prepare prior to land application activities, and made available to DEQ at the land application site. NMPs are most efficacious when written just prior to biosolids applications so as to capture the most up-to-date data regarding crop type, soil nutrient levels, and other site conditions that may change over time. All plans must be written by a planner certified by DCR, in accordance with the specifications outlined in DCR nutrient management regulations ([4VAC50-85-10 et seq.](#)).

12. Application Rates

Comments were received questioning appropriate applications rate when not all biosolids constituents are known and lack of regulation for phosphorus applications.

Staff Response:

Only primary plant nutrients (nitrogen and phosphorus) are used for determination of the appropriate application rate, which is based on agronomics. The NMP requires that crop type, soil productivity level, soil nutrient levels, and biosolids nutrient content be used to determine the appropriate agronomic application rate.

Nitrogen application rates are based on the current season's crop uptake, as nitrogen is more mobile and subject to loss more quickly. Phosphorus application rates are based on the potential for loss over a longer period of time due to the fact that phosphorus is less mobile; loss potential depends upon agronomic practices that reduce erosion and soil phosphorus saturation levels. The DCR nutrient management regulations ([4VAC50-85-10 et seq.](#)) limit biosolids phosphorus application rates based on soil phosphorus saturation levels. Biosolids application is precluded if soil phosphorus levels reach specified limits.

Concentration limits and total allowable loadings of other biosolids constituents are based upon what is considered to be protective of human health and the environment; these limits and rates are not based in agronomics. The EPA risk assessment that informed development of the federal limits and the biennial EPA reviews have not identified limits for constituents other than those identified in the permit. As stated in the Biosolids Expert Panel report, "while certain contaminants have been found in land-applied biosolids, mere presence will not in itself cause water quality impacts without a means to reach ground and surface waters. Additionally, presence does not indicate danger without a toxic concentration."

13. Medically Sensitive Individuals

Comments were received regarding effects of biosolids exposure to medically sensitive individuals:

- Staphylococcus aureus infection of family member that lives adjacent to application site;
- No tracking mechanism for illnesses potentially caused by exposure to biosolids; and
- DEQ handling of complaints about illnesses potentially caused by biosolids exposure.

Staff Response:

The permit contains the provisions established in the VPA Permit Regulation at [9VAC25-32-560](#) regarding establishment of setbacks and agency response to requests for extended setbacks. DEQ developed these regulations in consultation with VDH. DEQ also developed a procedure for working with VDH to consider extended setbacks for citizens with specific health conditions. When a citizen attests that standard setbacks from homes and property lines should be extended based on medical reasons, DEQ will double the setback distance upon written request from the citizen's physician. DEQ provides the forms to those requesting extended setbacks with instructions as to where to send the form once completed. Setback distances may be extended beyond the doubled setback where an evaluation by VDH determines that an additional setback is necessary to prevent adverse effects to the health of an individual.

In the event that a citizen requests an individual assessment regarding a site with an active permit, the land application of biosolids may continue while the health investigation is conducted, under the following circumstances:

- i. Extended setbacks of 400 ft from the residence and 200 ft from the property line are implemented;
- ii. DEQ has verified compliance with all regulatory requirements at the site; and
- iii. The Health Commissioner has not issued an emergency order to cease operation of the biosolids use activity pursuant to [§32.1-13 of the Code of Virginia](#).

DEQ refers individuals who report illnesses related to biosolids exposure to the VDH Local District Health Director.

14. Sampling of Biosolids and Soils

Comments were received questioning procedures and chain of custody requirements for biosolids and soil sampling.

Staff Response: Part I.B.1.a.(4) of the permit requires that supporting documentation for monitoring of biosolids and soils, including laboratory chain of custody forms and certificates of analyses, shall be included in reports.

15. Biosolids Use in Other Counties

Comments were received questioning why the biosolids that would be land applied in Madison County will not be land applied in other counties in Virginia.

Staff Response:

Biosolids are land applied in many counties throughout the Commonwealth, including the neighboring counties of Culpeper, Greene, and Orange.

16. Public Hearing Procedures

Comments were received regarding regulations that require a court reporter to transcribe public hearing testimony during a public hearing and if public testimony was not transcribed during the hearing, a new public hearing should be held.

Staff Response: DEQ acknowledges the regulatory requirement in State Water Control Board's Procedural Rule No. 1 found at [9VAC25-230-80.C](#). for the preparation of a verbatim transcript by a court reporter. DEQ records the entirety of public hearings using an audio recording and makes the recording available to members of the public that request it. The audio recording of the June 8, 2016 public hearing is available upon request.

17. Support of Permit Issuance and Biosolids Use

Comments were received that supported the issuance of the permit and biosolids use. These comments included:

- Long time use of biosolids with no environmental or health effects observed;
- Absence of health issues in young and old family members living near sites;
- Livestock and forage products produced on farms fertilized with biosolids meet quality tests required for export;
- Biosolids application supports healthy populations of microorganisms in soil;
- Agricultural community needs the benefits provided by biosolids;
- VDH literature review in 2014 indicated there does not seem to be a significant health risk when biosolids are managed and monitored appropriately;
- Research indicates that risk of exposure to polybrominated diphenyl ethers (PBDEs) and estrogenic compounds is low, and exposure is more likely due to other sources, such as household dust;
- Additional research is needed, but current studies do not indicate land application of residuals to be a major source of exposure;
- Additional research is ongoing by EPA, USDA, universities and municipal governments;
- EPA requires a review of the federal regulations for biosolids every two years to review the need to regulate additional pollutants; and
- Science supports the beneficial use of biosolids in agriculture and on forestland.

Staff Response:

DEQ acknowledges the comments provided.