



February 6, 2019

East Whiteland Township Board of Supervisors
East Whiteland Township Planning Commission.
Municipal Building
209 Conestoga Road
Frazer, PA 19355

Dear Supervisors and Planning Commission members,

The Delaware Riverkeeper Network believes that you have no choice but to reject the proposal from Constitution Drive Partners to develop the over 13 acre Bishop Tube site with 93 residential units, including roadways, driveways and stormwater management systems.

Groundwater, soil and surface water at the Bishop Tube site are highly contaminated with Trichloroethylene (also referred to as Trichloroethene or TCE), which is classified as a probable human carcinogen by the EPA. Other contaminants also permeate the site. This highly contaminated condition, coupled with the intensity of the proposed development that will have unacceptably high impacts on the environment, the exceptional value Little Valley Creek, and the surrounding community demands the denial of Township approval. Your duties pursuant to local law and the Pennsylvania Constitution prohibit any other alternative at this time.

Size, scope and intensity of proposed development of the Bishop Tube site remains the same.

The October 9, 2018 development proposal dubbed "Malin Road Development" is the newest proposal to advance residential development of the highly contaminated Bishop Tube site. The development proposal, while a seeming change from Constitution Drive Partners (CDP)'s original 228 unit proposal, is merely a reduction on paper and in presentation of the proposed development and associated impervious cover. The reduction in units is not the result of a less intense development proposal for the Bishop Tube site of 13.7 acres. Rather, the reduction is the result of the removal of approximately 10 acres of land originally included for development -- two adjacent parcels totaling approximately 10 acres have been removed from the development proposal along with the associated housing units. The revised development proposal submitted for review and approval covers the same contaminated portions of the Bishop Tube site as did the original plan with the same intensity of development for this site. And so, to be clear, the overall footprint of the development to take place on the 13+ acres of the Bishop Tube site has not been reduced; the reduction in the size and scope of the

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project is the removal of the portions of the development associated with neighboring parcels that are no longer a part of the current proposal.

Pennsylvania Constitutional Duties Prohibit Anything Other Than Denial At This Time.

Pursuant to the Pennsylvania State Constitution, Article 1, Section 27,

The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustee of these resources, the Commonwealth shall conserve and maintain them for the benefit of all the people.

It is well established that these Constitutional duties apply to **all** levels of the Commonwealth government, including local municipalities. East Whiteland Township's elected officials and township representatives are duty bound to protect these constitutional rights, including by acting as trustee of the public natural resources within, and impacted by, its authority. In order to honor this constitutional obligation, the Township's Board of Supervisors, Planning Commission, and others working on their behalf are duty bound to engage in informed decision-making when considering the actions they will take and/or allow at the Bishop Tube site and to ensure the decisions they render do not directly, indirectly, or through the actions of others, violate the constitutional rights of the people and/or the trustee obligations of the township. East Whiteland Township cannot comply with its constitutional duties if it approves the CDP development proposal based on the science, facts and impacts on the record.

Amongst the constitutional obligations of Township officials implicated pursuant to Article 1, Section 27 of the Pennsylvania State Constitution are:

- ⇒ the duty to consider environmental consequences as part of your decision-making process;
- ⇒ the obligation to conduct a pre-action analysis in order to fully understand the conditions in existence at, and impacted by, the Bishop Tube site and the effect your proposed actions/decisions will have on the environment; to consider the cumulative impacts of your proposed action/decision when viewed with other actions/activities/conditions impacting the site; to include all relevant science, facts, and effects necessary to ensure an informed decision and to fully understand the environmental and community consequences of the action/decision you are proposing to undertake;
- ⇒ to exercise the duties of prudence, loyalty and impartiality in fulfilling your constitutional duties to prevent and remedy the degradation, diminution, or depletion of the public natural resources implicated by your actions/decisions;
- ⇒ the duty to equitably treat all of the beneficiaries of the public natural resources at stake and in your community when engaged in Township action/activity/decision making;
- ⇒ to use an anti-degradation approach to decision-making including: understanding what pollutants or levels of degradation are already affecting the public natural resources at issue, including the air, land, water, groundwater, wetlands, plant and animals species; understanding the level of degradation present at the site and how the affected public natural resources will be impacted by the implementation of your actions/decisions; ensuring that your actions/decisions do not result in degradation, diminution or depletion

of the impacted public natural resources, whether that impact be the direct result of your decisions/actions or indirectly through the acts of others that you enhance/advance/encourage; and

⇒ the duty to act affirmatively to protect the environment.

Given the highly contaminated conditions at the Bishop Tube site and:

- the lack of information regarding the extent of the pollution at the site;
- the lack of information regarding the extent of the contamination plume emanating from the site;
- the lack of information regarding the full extent of contamination at the Bishop Tube site in the soil, subsoil, groundwater and bedrock;
- the lack of information regarding what remediation will ultimately be proposed to address the contamination at, and emanating from, the Bishop Tube site;
- the lack of information regarding the impacts of the proposed development on the existing contaminated condition of the site and or contamination emanating from the site;
- the lack of information and/or consideration of the impacts of the proposed development on the ability to remediate contamination at and/or emanating from the Bishop Tube site;
- the lack of information on how, and to what extent, existing contamination at the site is impacting the Little Valley Creek stream system and how that current impact will be affected if the proposed development were allowed to advance;
- the failure to fully consider how the ongoing contamination at the site might impact the health, safety, property values, and/or property sanctity for future residents of the site;
- the failure to fully consider the implications of developing this site, including in its highly contaminated condition, for nearby, downstream and neighboring communities and residents;
- the lack of scientific evidence providing details on any of the above;

the East Whiteland Township Supervisors and Planning Board cannot possibly fulfill their obligations pursuant to the Pennsylvania Constitution as noted above and in applicable judicial proceedings.

With such an abject lack of scientific and public health information and analysis, the Supervisors and Planning Commission cannot possibly understand the implications of developing this site at this time and in the manner proposed for: the environment; Little Valley Creek and associated wetlands; groundwater contamination; the potential to carry out any proposed remediation at or beyond the site; the future contamination of soils, groundwater and the environment; the existing and expanding plume of contamination; the health and safety of the surrounding and/or downstream communities and environment; and the health and safety of the future residents to be located at the site. This in turn prohibits the Township from being able to carry out your constitutional obligation to prevent degradation, diminution, or depletion of public natural resources.

Township Ordinances Prohibit Approval of The Current Proposal.

In addition to your constitutional obligations, Township officials have duties under Township ordinances. We provide this initial consideration of ordinance obligations and impacts, understanding that township officials are already considering how to proceed with regards to the CDP Bishop Tube site development proposal. Additional information will follow as developed/secured.

According to the East Whiteland Township Subdivision and Land Development Ordinance (SALDO) § 175-2 (emphasis added):

The purposes of this chapter are to:

- A. Provide** for the harmonious, orderly, efficient and integrated growth of the Township, and **the preservation and protection of the public health, safety and general welfare.**
- B. Assure that land to be developed shall be of such character that it can be used safely without danger to health** or peril from fire, flood, erosion, smoke **or other menace.**
- G. Assure that land will be developed** with full and constant regard to topography and geologic conditions, **so that the natural beauty of the land and vegetation shall be protected and enhanced.**
- H. Provide for adequate open spaces for recreation, light and air and for adequate sites** for schools, parks, playgrounds **and other community services, which shall be so located as to provide access to such facilities for residents of all neighborhoods.**

The Township's Soil Erosion and Removal Ordinance, in Section 159-14, further provides (emphasis added):

A. General provisions.

- (1) All erosion, sedimentation and grading activities shall be so performed as **not to endanger or damage public or private property, or to cause physical damage or personal injury.** All precaution shall be taken to prevent damage of adjoining streets, sidewalks, buildings and other structures as a result of settling, cracking, erosion, or sedimentation. The permittee is responsible for any damage or personal injury caused by his activity authorized by the permit.

The ongoing and highly contaminated condition of the Bishop Tube site, and the absence of data, scientific analysis, scientific and factual information, and a plan for remediation, coupled with the incredibly dense and substantial residential development proposed by CDP means that Township officials cannot possibly undertake a decision to advance development of the Bishop Tube site as proposed consistent with the dictates of Township ordinances. The circumstances prevent the Township from providing for "the preservation and protection of the public health, safety and general welfare," "assur[ing] that land to be developed shall be of such character that it can be used safely without danger to health.... or other menace," "assur[ing] that the land will be developed so that the natural beauty of the land and vegetation shall be protected and enhanced" and "not . . . endanger[ing] or damage[ing] public or private property, or . . . caus[ing] physical damage or personal injury."

In addition, as residents have testified to multiple times, this portion of East Whiteland Township does not have the same access to, or benefits of, nearby open space. The Bishop Tube site and neighboring parcels, with their woodlands, wetlands, stream, habitats and animal life is significant and nearby natural space of tremendous importance to this portion of the East Whiteland community. With all things considered, including the years of adverse impact that surrounding property owners and residents have been subjected to, a decision to allow development of this site as proposed also violates the purpose of Township ordinances to "Provide for adequate open spaces for recreation, light and air and for adequate sites for community services, which shall be so located as to provide access to such facilities for residents of all neighborhoods."

Furthermore, as stated by Dr. Tom Myers in the attached expert report:

“The proposal would violate several standards of relevant zoning requirements in ways that would harm the environment, contrary to the intent of the zoning regulations (§200-57A). Excavation and development at the site could cause “potential hazards to life and property” and disrupt the “ecological balance” by causing increased runoff, erosion, and sediment with contaminated soils, including those contaminated with TCE (§200-57A(2)). Significant erosion of contaminated soils could result in contaminated deposits that would cause the Township to spend funds to remediate, in violation of §200-57A(3). Excavation would add contaminants to the groundwater and downstream waters in ... ways, which are contrary to the zoning regulations.”¹

Finally, approvals under local ordinances still must comply with Article 1, Section 27’s mandate that full and accurate information be provided upon which an informed decision can be made. Such information simply does not exist at this time for the Bishop Tube site and its proposed development. This information – a complete understanding of site conditions, the path and potential for site remediation, and the implications of the proposed development – are not expected at any time in the near future either.

Additional expert review regarding compliance with township ordinances will be forthcoming.

The Environmental Impact Assessment provided by CDP is deficient and does not support approval of the CDP development proposal.

Section 175.23 of the Township’s SALDO requires submission of an Environmental impact assessment (EIA) for this proposed project.

(C)(1)(c) mandates the EIA include: “A description those remedial, protective and mitigative measures proposed by the developer to control all adverse impacts upon site features which will occur as a result of the proposed subdivision or land development. An adverse impact is any development activity which will alter the site features described in Subsection B hereof. These measures shall include those measures mandated by current federal, state, county and Township statutes, ordinances and regulations, including but not limited to sedimentation and erosion control, stormwater runoff control, water quality control, air quality control, wetlands and similar requirements related to remediation of adverse impacts of a specific project such as regrading, revegetation, screening and the creation of landscaped areas, wetlands, fencing, emission control, traffic control, noise control and similar requirements.”

(C)(3) mandates the EIA include: “Natural resources impact. A study prepared by a registered professional engineer indicating the likely impact of the proposed development on the existing sewer, water, groundwater, solid waste and drainage systems serving the Township.”

As noted by Dr. Tom Myers in the attached report:

“As it stands, the EIA is not useful because it provides little information about the hydrology of the site beyond noting the underlying formations contain a good amount of water and that the

¹ Attached memo from Dr. Tom Myers provides additional specific detail.

stormwater management plan includes infiltration systems to offset the loss of recharge on the site. Smiley (2015) refers to the Bishop Tube industrial site only by claiming the project would be a benefit to the area by removing the contamination and taking down the old building which is a visual issue for the area.”

The Environmental Impact Assessment does not accurately discuss or represent the extent of site contamination or the current status of efforts to remediate the site. In fact, the Environmental Impact Assessment contains a mere 2 paragraphs by my reading that include even a discussion of the TCE conditions at the site. There is a total failure of the assessment to fully, fairly or accurately discuss the dangerous contaminated condition of the site or the status of remediation. Contrary to what the Environmental Impact Assessment states, the site is not in fact undergoing remediation and the extent of the contamination is not fully documented at this time, as such the following statement is simply false:

“The property is documented as contaminated by PADEP and is undergoing remediation under the authority of the Hazardous Sites Cleanup Act (HSCA) via the cooperation of the landowner/ developer, Township, and PADEP.”

Given the lack of full and accurate information regarding site conditions, it is simply impossible for the developer to provide, nor has the developer in reality provided, the Environmental Impact Assessment required by Section 175.23 of the Township’s SALDO.

In addition, as noted above, the Environmental Impact Assessment does not, and given the current state of things cannot, consider the measures mandated by the state for contending with existing site conditions and/or what will be the adverse implications of the proposed development for the remediation of the site’s current contaminated condition. Quite simply because no one yet knows the full extent of the contamination or how that contamination is to be remediated, there is no way to understand the impacts of the proposed development on these issues.

Based on current facts, science and law, approving development of the Bishop Tube site is unsafe and unsupportable.

There is a long check list of questions, issues and concerns that prevent justified approval of the proposed Bishop Tube development project pursuant to the Pennsylvania State Constitution and/or the Township’s ordinance.

A number of concerns are raised in the attached analysis by Dr. Tom Myers, among them:

- The development as proposed and complimented by the current site status regarding site investigation and remediation “means that TCE will remain in place and [be] a source of TCE far into the future”,
- That CDP is limiting the zone of its obligation in significant and meaningful ways that impact the duration of site contamination,
- CDP refuses to consider whether backfilling with clean gravel would “exacerbate migration of contaminants in groundwater or subsurface vapors” in ways that may have a significant and concerning impact.

In addition to the concerns of Dr. Myers and those raised above in this comment letter, the Delaware Rivekeeper Network identifies a number of other issues of significant concern:

- Investigation of the surficial soil at the site is incomplete. DEP and others are still in the process of investigating potentially contaminated areas. Development prior to completion of investigation could prevent soil sampling in areas that some former employees claim might be contaminated.
- The remediation currently proposed by the developer is limited to surficial soil areas currently known to be contaminated, but is not proposing to remove all that contamination to the extent possible. In addition, there is information on the record that firmly suggests the extent of the soil contamination is beyond what the developer is acknowledging and/or proposing to address in their “hot spot” approach.
- As proposed by the developer, soil contamination above bedrock and below groundwater would be left in place. Development of the site as proposed could prevent excavation of this contamination, which is presumably one possible cleanup methodology to be considered in the feasibility study, which is not yet completed. As such, development as proposed would very literally impede, if not prevent, full, proper and legal cleanup of the Bishop Tube site necessary for protection of the environment and people.
- Further, without an adequate model of the on-site groundwater contamination, it is not possible to determine the contribution of the remaining contamination to the contamination entering Little Valley Creek and/or the off-site plume. The need for remediation of this contamination is thus not yet known.
- While soil vapor extraction might possibly be a remedial method for the VOC component of the contamination at the site before and after the proposed development, that determination has not yet been made. Moreover, the potential impact of ongoing or completed development on any technologies to be evaluated in the feasibility study has not been determined. There may also be other contaminants that cannot be remediated by vapor extraction and that might require extensive excavation.
- Investigation of the off-site plume has not been completed. In particular, there appears to be the potential for the plume to extend further off-site than apparently previously contemplated, possibly as far as the Schuylkill River itself. (See sample results from monitoring well (MW) 33, MW-32, MW-80, and now at 50 S Morehall Road, which align fairly well along the expected groundwater flow pathway.) The size and effects of the off-site plume have therefore not yet been determined, so the potential effects of the entire contamination are not yet known. The scale of the remedial technology required at the site to mitigate such effects is also not yet known, so it is impossible as yet to determine whether development at the site would interfere with whatever technologies are proposed in the feasibility study, let alone which ones are ultimately chosen. Clearly, based on the information and lack of information currently available, development at this site cannot be permissibly (legally, morally or constitutionally) approved.
- The land development plan as proposed lacks many essential details. For example, the extent of even the *proposed* cleanup of known contaminated areas is not specified. There are no

details of the methods to be used to ensure containment of contaminated soil, how it is to be confirmed that the excavations are sufficiently extensive, the contaminant levels to be allowed to remain in soil, and so forth.

- Any development plans produced should also include details of the potential effects of the development on any contamination remaining at the site at the time of development. Thus, the plans should detail how they dovetail with each of the potential remedies proposed in the feasibility study, and the effect, if any, on those potential remedies. For example, the current land development plans will affect the quantities and locations of infiltration on the site, but do not evaluate what effect this might have on streamflow in the Little Valley Creek, on contamination entering the Little Valley Creek, or on the off-site plume of contaminants. Without such information, development is contra-indicated until it is shown that such environmental effects would be acceptable to DEP, the Town, and any other relevant parties.
- As the attached report by Dr. Tom Myers notes, there are already concerns about potential indoor air quality concerns for residents in neighboring General Warren Village. It would be a tremendous betrayal to these residents, and potential future residents at the Bishop Tube site, to approve residential development for anyone at or near this location given the current state of the knowledge, science and situation.
- The contaminant plume at the site has not been adequately mapped, according to a significant amount of correspondence between PADEP and the responsible parties.

Until an adequate clean-up plan is (i) proposed, (ii) negotiated with DEP and the Town, conforming to the regulatory requirements for such clean-ups and conforming with the obligations of Article 1, Section 27 of the Pennsylvania Constitution, and (iii) completed to the satisfaction of all parties and the public, permission for development cannot even be considered and must certainly be refused.

The Development Proposal, alone and in combination with existing contamination, will impermissibly impact an Exceptional Value Stream, including because of the stormwater strategies being proposed.

The Delaware Riverkeeper Network will be providing additional analysis, but with this initial comment we share a few important preliminary observations.

The Valley Creek Basin in Montgomery and Chester Counties, including the Little Valley Creek, is designated as Exceptional Value, giving it Pennsylvania's highest level of protection.

As an MS4 community, East Whiteland needs to consider Pollutants of Concern and the reasons for which their streams have been identified as impaired. Little Valley Creek is impaired for urban runoff, water flow variability, habitat modifications, siltation, pathogens and PCBs. While not officially impaired for TCE, we know this is a serious contaminant being discharged from the Bishop Tube site into Little Valley Creek. These are issues the Township needs to consider in any decision advanced. Among other things, urban runoff, water flow variability, habitat modification, and siltation are likely to be impacted by the CDP development plan.

CDP is proposing to use infiltration for its stormwater management. Best management practices that are being discussed include rain gardens, infiltration trenches, vegetated swales, pervious pavers.

And yet, we are dealing with a site for which infiltration is a serious concern in that the site is highly contaminated.

At the same time the proposal talks about these various infiltration strategies for stormwater management, the *CDP's own development plans* say that infiltration is *not* recommended due to soil contamination so the rain gardens and infiltration trenches will be underlain by an underdrain and encapsulated in a PVC liner to provide extended detention. If that is the case, then we are dealing with peak rate and/or detention strategies. It does not appear that the proposal seeks to address the volume of runoff through prevention or management using other best practices.

If infiltration is not feasible, then a detention approach **MUST** replicate a natural groundwater release rate for Little Valley Creek to avoid the water quality problems associated with detention. For the small frequent rainfall events of 1.5 inches or less (that comprise approximately 95% of the rainfall events in Chester County and are essential to groundwater recharge and stream baseflow) the site stormwater system should capture and “slow release” the treated runoff at a rate that replicates groundwater discharge in Valley Creek, approximately 0.01 cubic feet per acre, or 0.1 cfs for the entire project site. A waiver from infiltration without an appropriate slow release rate is a detention system.

The nonpoint source pollution that is generated by stormwater runoff is persistent and invasive and will exacerbate the water quality problems already of concern for Little Valley Creek. Stormwater washes a myriad of pollutants from urban/suburban areas during rain events including: sediment, soils, nutrients (including phosphorus and nitrogen), copper, zinc, and other heavy metals (including lead), fecal coliform bacteria, hydrocarbons-oils-greases, atmospheric deposition, vehicle emissions, pavement deterioration, tire and brake pad dust, pet waste, chemicals and fertilizers used in lawn care, road salts and de-icing chemicals and their agents, household chemicals, and organic and inorganic debris. Stormwater also increases temperatures. The CDP development proposal does not have an obvious strategy for water quality. While there is a suggestion of infiltration, which would be unwise on a site of this kind, the proposal actually appears to be dependent on peak rate management, which will not address the water quality issues of concern. Of additional and growing concern across the state and also for Little Valley Creek will be the addition of road salts that will result in an increased level of salinity in the stream if not carefully and directly managed.

The development and stormwater proposal continue to operate on the assumption that there are but a few hot spots on the site of concern when it comes to TCE, but that is simply not the case. There is ample evidence on the record to demonstrate that contamination in the surface soils is well beyond the claimed hot spots. There is expert evidence² as well as other information referred to by DEP on the record on this issue, but not included in any of the development proposal filings.³

² See, for example, Dr. Tom Myers report attached in which he notes: “The proposed residential development includes a remediation plan that targets excavation of impacted soils from three discreet areas (Figure 7). Environmental Standards (2017, p 4-4) proposed excavating soils with more than 500 ug/kg of TCE but not deeper than bedrock or saturated conditions. The proposed excavation would include 10,788 tons of soil (Environmental Standards 2017, p 4-2), rather than the 16,511 tons previously proposed (Environmental Standards 2016b, p 4-2). “

³ “Information obtained from some of these witnesses has suggested that certain areas of concern, not previously fully characterized, may be contributing to contamination at the former Bishop Tube property” Letter from Armstrong DA and Staron R, PADEP to Martin GD, Roux Associates, Re: Bishop Tube Site, Concluding Remedial Investigation Activities, dated September 27, 2018.

“[T]here has been substantial TCE contamination found northeast of the site along Little Valley Creek. If Bishop Tube is the source, the evidence of high TCE concentrations so far offsite demonstrates the risk the site poses for downstream locations. Until onsite contamination is fully located and characterized, developing the site as proposed would likely cover or otherwise render inaccessible these new identified contaminated areas.”⁴

In addition, given the evidence on the record contradicting CDP’s claims of limited contamination, as well as the lack of data on the record as to how far that contamination spreads, DEP is continuing to require sampling and analysis in order to understand the full extent of the site contamination as well as the extent of the expanding plume. In the absence of solid data, it is wholly irresponsible for the Township to approve a development project that is dependent on the assertion that there are only 3 hot spots in need of attention prior to development. In fact it rises to the level of being unconstitutional to depend on such an assertion in the face of the evidence on the record about broader contamination and ongoing activity attempting to delineate that contamination.

Imposing responsibility on the future Homeowners Association is inappropriate.

The development plans say that stormwater facilities will be “owned, operated and maintained by the Homeowners Association”. Given the highly toxic condition of the site and the potential impacts of stormwater facilities in relation to contamination at the site and the spreading contamination plume, it would be egregiously irresponsible to agree to a proposal that requires the future Homeowners Association to bear responsibility for these stormwater facilities, potentially opening the door to legal or moral liability that is neither explored nor discussed in the development plans.

Township should be actively reaching out for additional review support.

I was surprised to learn that there had been no effort to reach out to any of the resource agencies that could help the Township assess this most recent development proposal. In response to my direct outreach I learned that no notification or request for review assistance had been submitted to the Pennsylvania Department of Environmental Protection, the Chester County Planning Commission, the Agency for Toxic Substances and Disease Registry, or the US Environmental Protection Agency. Given the technical expertise of each of these agencies and their demonstrated interest in the Bishop Tube site, it seems a tremendous missed opportunity not to have done this outreach.

The Delaware Riverkeeper Network will continue to submit comments and technical analyses as they are developed.

With regards,



Maya K. van Rossum
the Delaware Riverkeeper

Attachment: Dr. Tom Myers, Technical Memorandum Review of Bishop Tube Superfund Site and an Assessment of the Site’s Proposed Residential Development, January 7, 2019

⁴ Dr. Tom Myers, Technical Memorandum Review of Bishop Tube Superfund Site and an Assessment of the Site’s Proposed Residential Development, January 7, 2019, based on revision to the site development plan

Cc:

Cosmo Servidio Regional Administrator, EPA Region III

Patrick Patterson, Regional Director, PADEP Southeast Regional Office

Brian O'Leary, Executive Director, Chester County Planning Commission

Senator Andy Dinniman

Senator Daylin Leach

Representative Kristine Howard

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Technical Memorandum

Review of Bishop Tube Superfund Site and an Assessment of the Site's Proposed Residential Development

March 10, 2017

Revised January 7, 2019, based on revision to the site development plan

Prepared for: Delaware Riverkeeper Network, Bristol, PA

Introduction

The Bishop Tube site is a 13.7 acre former metals processing plant located in East Whiteland, PA just south of Lancaster Avenue. It initially had been used for the construction of tubing from stainless steel and more recently operated as a metal alloy tube manufacturing facility until it closed in 1999 (Roux Associates 2015, p 17). "During certain periods of time, chlorinated solvents were used at the site" (Id.).

The area has recently been rezoned for residential purposes, and the current owner, Constitution Drive Partners, L.P. (CDP), proposes to construct townhomes and apartments on the site (Environmental Standards 2017, p 1-1). Residential development at the site would be regulated according to Township of East Whiteland zoning regulations, with specific attention to Section 200-57 for portions of the site that are steep. CDP would excavate soils with high levels of trichloroethene (TCE) and tetrachloroethene (PCE) from three areas of concern (AOCs) and ship the soil offsite for disposal (Environmental Standards 2017). An AOC is an area where the concentration exceeds various standards.

The purpose of this technical memorandum is to identify issues of concern with respect to developing the site for residential use. This has primarily been considered with respect to long-term risks of developing new uses at the site. I reviewed the 2015 Remedial Investigation Report (RIR) (Roux Associates 2015) as a primary source of information. I supplemented the RIR with a 2009 groundwater investigation (Baker 2009) for an improved description of groundwater flow. I also consulted other studies, as available, and a general flow model report developed by the US Geological Survey (Sloto 1990).

Specifics of this technical memorandum include a review of the contaminants and hydrogeology at the site, and the development of a conceptual flow and transport model (CFTM). A CFTM describes the flow paths and how contaminants move through the site. This is necessary for understanding the risks of existing contamination at the site and the risks of moving or changing the existing conditions.

Bishop Tube Site

The Bishop Tube Site is a former metals processing plant, as noted in the Introduction. The site is relatively steep, with ground surface contours dipping steeply to the north and to Little Valley Creek on the east side of the site. South and east of the site, near Little Valley Creek (LVC), the site is also wooded, as may be seen on Figure 1.

Groundwater, soil and surface water at the Site are contaminated with TCE, which is classified as a probable human carcinogen by the EPA, and related products. TCE is a chlorinated solvent and one of the problematic volatile organic compounds (VOCs) identified at the site, first in 1987 (Environmental Standards 2017, p 1-3). Chlorinated solvents are dense non-aqueous phase liquids, or DNAPLs. They are denser than water and have a low solubility. However, they are sufficiently soluble to cause a problem in both ground and surface water. The EPA maximum contaminant level (MCL) for TCE is 0.005 mg/l, with a zero desirable concentration (<https://www.epa.gov/ground-water-and-drinking-water/table-regulated-drinking-water-contaminants#Organic>, visited 2/18/17). EPA lists it as a discharge from metal degreasing sites or other factories and that it causes liver problems and an increased risk of cancer (Id.). Related compounds could include 1,1,1-trichloroethane and 1,1,2-trichloroethane (Id.).

RIR sections 5.1, 5.2, 5.3, and 5.4 describe the target criteria for remediating the site for soils, groundwater, surface water, and indoor air quality, respectively. Regarding soils, the RIR notes the “potential for future Site redevelopment for residential use” (Roux Associates 2015, p 32), as described in the Revised Remediation Standards (Environmental Standards 2017). TCE Act 2 residential Site Health Standards (SHS) is 0.500 ug/kg; eight of 20 soil samples exceeded this level (Environmental Standards 2017, p 2-3). CDP argues they are not responsible for remediating groundwater or unsaturated soils outside of the three AOCs (Environmental Standards 2016a).

Surface water standards are based on mostly trespass scenarios with only brief dermal contact and no drinking water use (RIR, Appendix C). The standards do not consider the risks to residents that might live in a residential development at the site due to an incomplete remediation.

Hydrogeology

The Bishop Tube site lies within the Valley Creek Basin on the west bank of Little Valley Creek (LVC) (Figure 1). Shallow groundwater, including in the bedrock, discharges to small local streams such as Valley Creek or its tributaries (Id.). Little Valley Creek (LVC) flows northward along the east side of the plant site (Figure 1). LVC is an “exceptional value” stream under the PADEP Code, Title 25, Environmental Resources, Chapter 93.

Groundwater flowing beneath the Bishop Tube site discharges to springs and to the LVC just east of the site, both increasing the flow and the load of TCE discharging from the site (as discussed in the next section). Three hydrogeologic layers underlie the site - an upper alluvium, or overburden as it is referred to in the RIR, and two layers of bedrock, a shallow weathered (fractured) bedrock and competent deep bedrock layer (Roux Associates 2015, p 25). The bedrock is predominantly carbonate (Roux Associates 2015, Sloto 1990). Most groundwater flow through this carbonate rock is through fractures, but there is no evidence of karstic conditions (Id.). The fractures are due to weathering and therefore are more prevalent near the surface of the carbonate. Therefore, hydraulic conductivity is highest near the top of the bedrock and decreases with depth as the fractures become less dense. Contamination flows to streams and downgradient wells through the thin overburden or the fractured bedrock beneath the overburden (Figure 2).

The potentiometric surface, or water table, for both overburden and bedrock at the Bishop Tube site (Figures 2 and 3) indicates groundwater flows to the north, or parallel to LVC until it turns northeastward north of the site to join the regional Valley Creek watershed flow. More detailed mapping through the site shows more northeastward flow through the middle of the site to the northeast corner where groundwater discharges through springs and seeps into the LCV (Figure 4), as also demonstrated by TCE concentrations, as discussed in the next section (Baker 2009).

Regionally, bedrock groundwater discharges to the Schuylkill River, or to the downstream end of Valley Creek (Sloto 1990). The river would be discharge point for any contaminant in the flow.

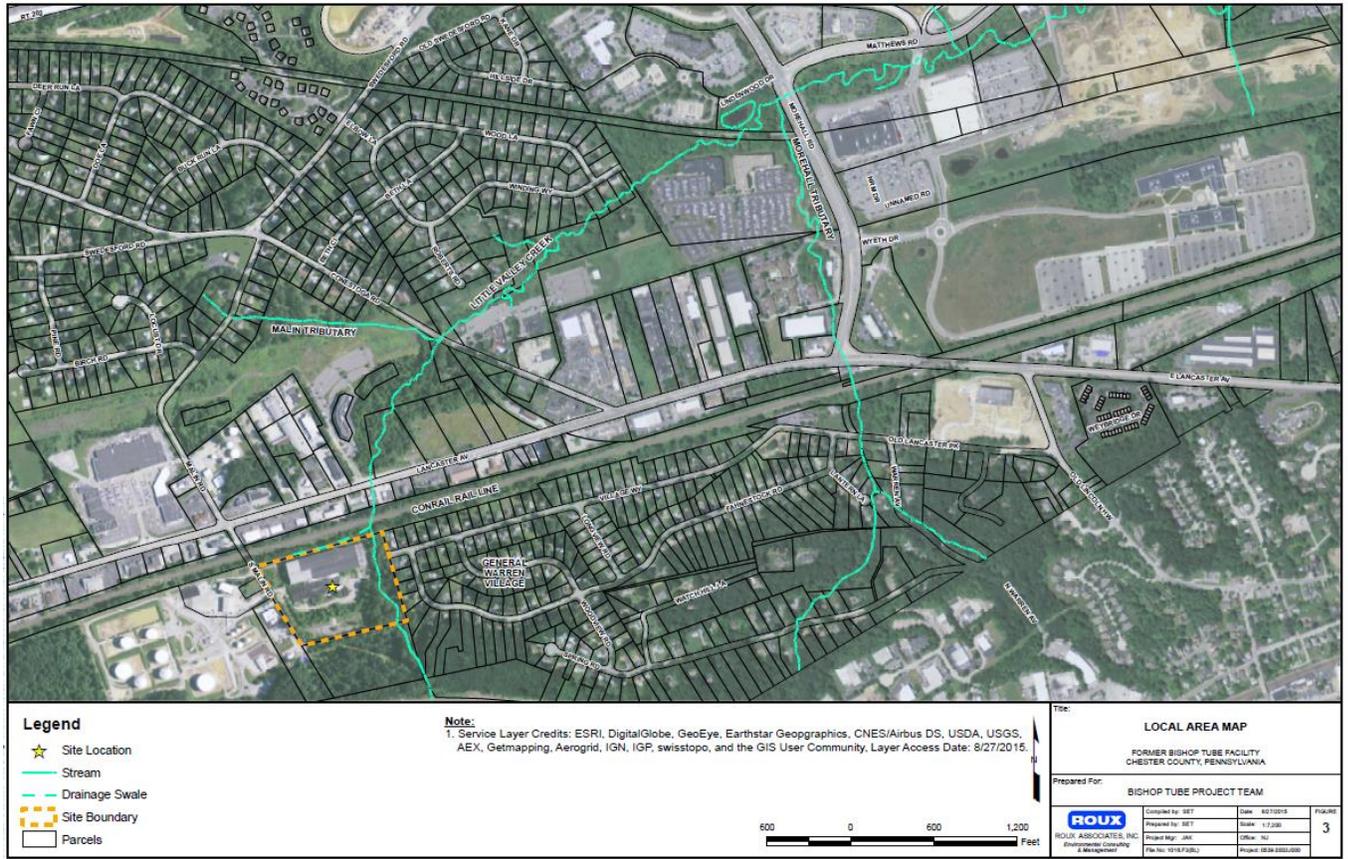


Figure 1: Local area map for the Bishop Tube site, showing the site and proximity to the Little Valley Creek. The site is on the southwest corner of the figure, outlined in dashed line. Source Roux Associates (2015) Figure 3.



Figure 2: Groundwater contours in the overburden aquifer, fall 2014. Source Roux Associates (2015), Figure 18 Overburden Wells

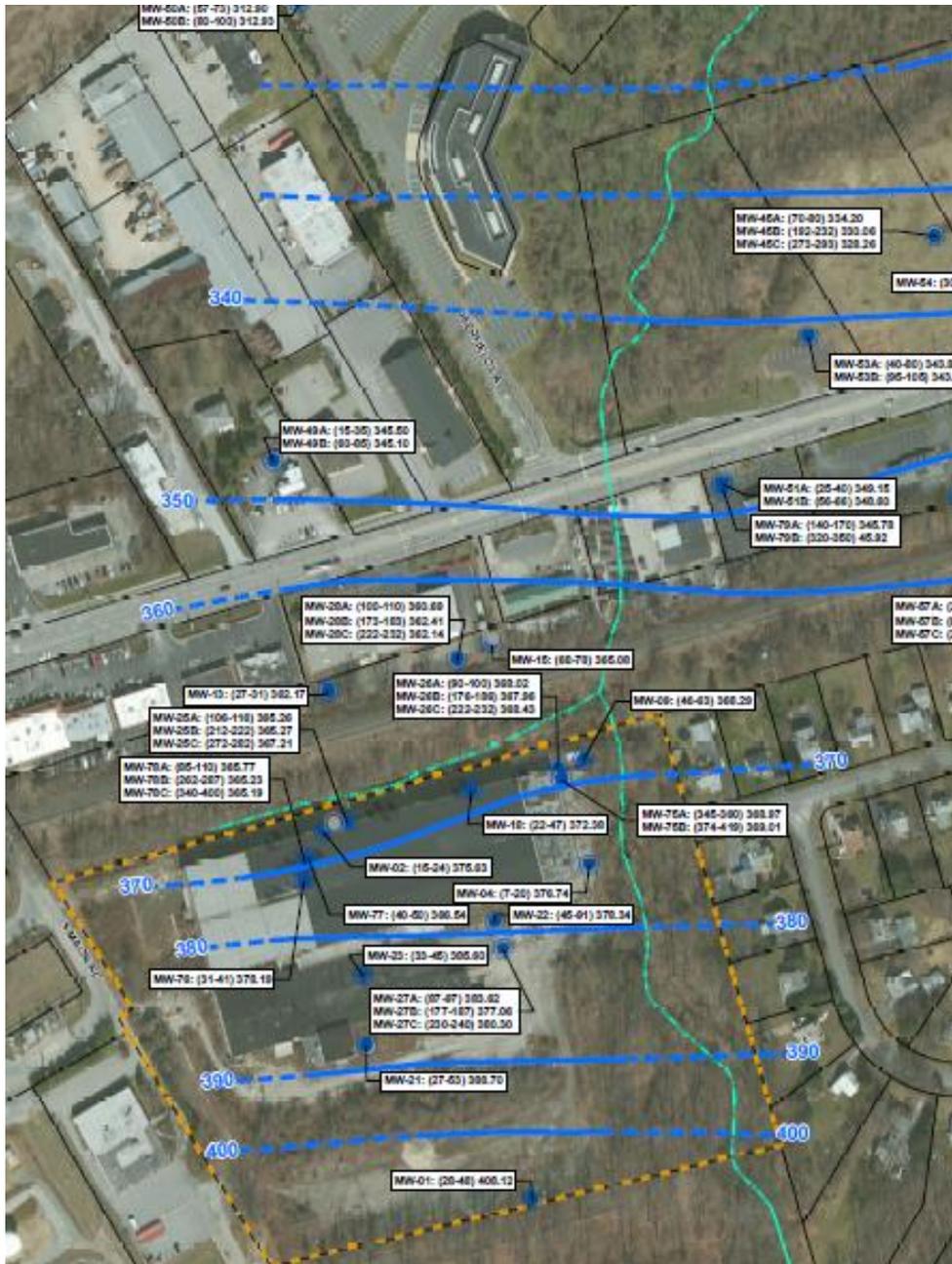


Figure 3: Groundwater contours in the bedrock aquifer, fall 2014. Source Roux Associates (2018) Figure 18 Bedrock Wells.



Figure 4: Shallow groundwater contours, first quarter 2007. Source, Baker (2009), Figure 2-2

Water Quality

There are very high TCE concentrations at the plant site and downgradient to the northeast (Roux Associates 2015, Figure 20). Concentrations are higher in bedrock with some being very high deeper in the bedrock. High concentrations occur at various depths in the bedrock, including 128,800 ug/l at 56-66 feet below ground surface (bgs) in MW-51B northeast of the site and 418,000 and 716,000 at 222-232 and 345-360 feet bgs, respectively, in MW-26C and MW-75A on the northeast corner of the site (RIR Figure 20A). This could be due to the high density causing TCE to flow deep into the bedrock, even against the hydraulic gradient, as well as there being less fracture volume to contain the groundwater.

Groundwater discharges to Little Valley Creek on the northeast side of the site (Baker 2009, p 8). TCE-laden groundwater discharges to LVC (Id.), along about a 600-foot stream reach (Baker 2009, p 13). As noted above, the solubility of TCE is low so that as it dissolves it could flow upward toward the streams where there is an upward gradient. The stream TCE concentrations increase where there are springs or where the stream gains flow over fracture zones. Baker (2009) also noted that most TCE contamination was in the bedrock fractures.

Graphs of TCE and related contaminants starting in 1987 for wells with a long record show that overall concentrations are relatively steady state, especially over the past twenty years (RIR, Appendix D). No evidence supports a conclusion that groundwater at the site is undergoing substantial natural remediation.

Upstream from Bishop Tube, surface water monitoring site SW-1 is essentially non-detect for TCE. Downstream from the site at SW-4, the concentration is about 26 ug/l, which is more than five times the surface water standard. Two springs entering from the site, SP-1 and especially SP-2, have substantial concentrations of TCE (Figure 5). Recent indications are that TCE and PCE have been found at high concentrations at monitoring wells (MW-81 and MW-82a) near 50 Morehall Road¹, which is more than a half mile northeast of the site along Little Valley Creek. Although Roux Associates suggests that there could be a different source, partly by observing that “the relative proportions of PCE are notably elevated on the 50 Morehall Road property”². An alternative explanation is differential attenuation of PCE and TCE or differential transport of PCE and TCE through LVC surface water from Bishop Tube to this site. If Bishop Tube is the source, this is evidence that site contamination is affecting more of the downstream watershed.

¹ Letter from Armstrong DA, Staron R, PADEP to Martin GD, Roux Associates, Re: Bishop Tube Site, June 15, 2018, Monthly Progress Report, dated June 28, 2018.

² Letter from Kowalkoski J, Martin GD, Roux Associates, Inc. to Armstrong D, PADEP, Re: Former Bishop Tube Site, Response to DEP’s June 28, 2018 Letter Regarding June 15, 2018 Monthly Progress Report.

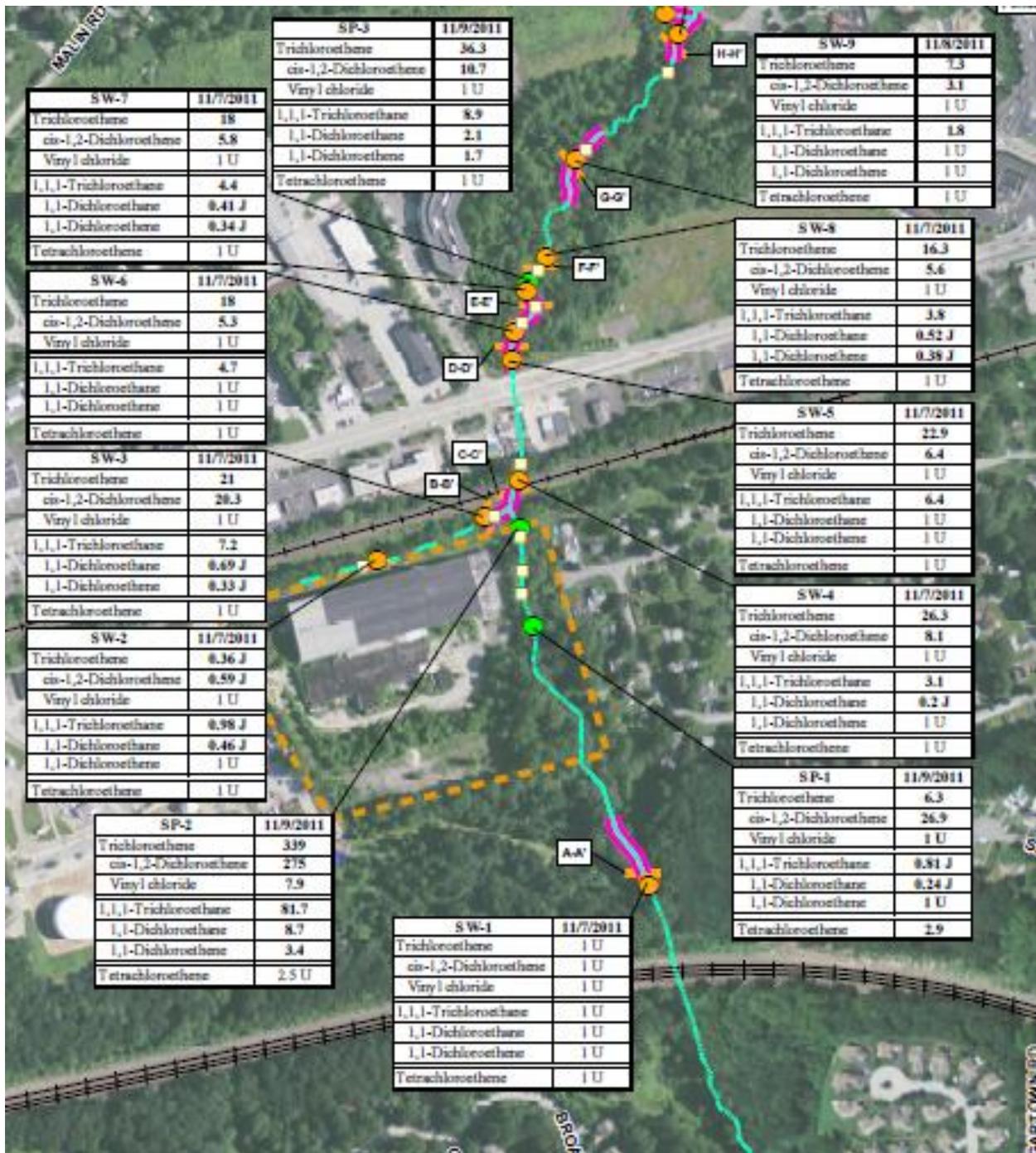


Figure 5: TCE concentrations in 2011 along Little Valley Creek. Source: Roux Associates (2015) Figure 6

Conceptual Flow and Transport Model at Bishop Tube

The pattern of water flow, both surface and groundwater, through the watershed both upstream and downstream of the site, is relatively simple. Recharge enters the overburden aquifer, which is relatively thin, and either flows a short distance to discharge into a spring or to

a stream or percolates deeper into the underlying fractured bedrock. The general groundwater flow direction in the Valley Creek watershed is west to east, especially in the bedrock aquifer. The flow direction in shallow aquifer depends on small-scale features such as small tributaries but at the site, groundwater flow is primarily to the north (Figures 2 through 4). There are only localized upward gradients.

Spills from the Bishop Tube Plant site have entered the soils beneath the site. Soil samples reported by Roux Associates (2015) reflect areas with high TCE concentrations in the soil above the water table. Recharge seeps through overburden and leaches residual TCE from the soils to the water table. TCE sinks deep into the bedrock fractures, as evidenced by high TCE concentrations at substantial depth (up to 400 feet). TCE dissolves into groundwater which means it is a continuing source until remediated.

Bedrock fractures divert groundwater flow to the east (Baker 2009). Groundwater flow and TCE transport follows the path of least resistance in a direction that is just north of east. Based on observations along the east boundary of the site, evidence that the plume continued to migrate eastward within the fractured bedrock aquifer, and the shallow depth to groundwater, the concentration of TCE and other contaminants “may present an indoor air quality concern to these residents” (Baker 2009, p 4 and 5) referring to residents in General Warren Village development. TCE volatilizes, or evaporates, and the resulting gas accumulates in overlying airspace such as a basement. This could occur if groundwater with TCE flowed under the subdivision.

TCE groundwater, spring, and stream concentrations are highest near the northeast corner of the site. This demonstrates that TCE continues to move from the site and reach downstream and downgradient locations. There are not enough downgradient bedrock wells to identify how quickly the groundwater TCE concentrations decrease with distance from the site.

The existing Bishop Tube structure and foundation likely prevents some potential recharge from entering the groundwater at the site. The lack of any significant gradient from under the site to LVC is evidence of a lack of recharge at the site. Because the gradient parallels LVC rather than converging on the stream suggests that some contaminants may remain in the groundwater longer than if there was more convergence to the stream.

Numerical Fate and Transport Model

The contaminant plume at the site has not been adequately mapped, according to a significant amount of correspondence between PADEP and the responsible parties. PADEP has most

recently expressed its desire for a final map of the plume to Roux Associates³. PADEP has been requesting Roux to complete a numerical model to assist delineating the plume and Roux has been arguing there is not enough data or understanding of the site to complete such a model⁴. PADEP has essentially required Roux to complete a model. “PA DEP has clearly stated its position on this issue and sees no reason for further debate over its request that a model be utilized to complete the RI”⁵.

PADEP is correct to request a numerical fate and transport model (FTM) to help develop the plume map for the site and north of Lancaster Avenue along LVC to Conestoga Road. A good numerical FTM would assist in the development of the concentration contours that define a plume map. A contour map is often completed just by interpolating between observations on a map. The interpolation may be aided by understanding the conceptual flow through the area. A numerical FTM would aid significantly in the understanding of the shape of a plume and identifying areas where additional data would be useful to improve the plume mapping. A numerical FTM would also be useful in designing a remediation plan for the groundwater at the site.

Roux (2015) Figures 19 and 20 show the layout of TCE observations that could be used. The data includes a time series of TCE concentration and data at two or more depths in places with nested monitoring wells. The plume mapping and modeling should not extend beyond these boundaries to MW-81 because of a lack of data in between the site and those distant wells and the possibility that the distant TCE could come from a different site or be the daughter product of a release from a different site. If the TCE at MW-81 is shown to be linked to Bishop Tube, it would be important to install several monitoring well nests between Conestoga Road and MW-81 to identify and understand the pathway.

Risks from TCE Contamination

Several issues at Bishop Tube affect water quality throughout the Valley Creek watershed. The most important is the potential for contamination to migrate from the site through groundwater to LVC through which it can move downstream to the river. There are vast amounts of TCE and contaminants stored in the soils at the site, which is a health risk for both direct contact to the soil and airborne TCE. Substantial amounts have also leached into bedrock fractures beneath the site, but not all sources of TCE have been identified. The fractures could be the best pathway to the stream because a fracture provides a confined fast pathway.

³ Letter from Armstrong DA, Staron R, PADEP, to Martin GD, Roux Associates, Re: Bishop Tube Site, Supplemental Remedial Investigation Activities, dated December 3, 2018.

⁴ Id. There is a series of correspondence between the two entities regarding the model.

⁵ Id. Page 2.

TCE will be a long-lasting contaminant source wherever it has settled deeply into the bedrock aquifer and could provide a source of TCE to upwelling groundwater for a long period.

Risks from Developing the Site

In 2017, Constitution Drive Partners proposed to develop 228 townhome sites for its Malin Road Development (Figure 6). The project has been revised to include 93 units on 13.7 acres (Figure 7). The revised project is approximately the northernmost six rows of the initial plan and covers the same contaminated portions of Bishop Tube as did the original plan. No update of the Environmental Impact Assessment (Smiley 2015) accompanied these revisions. As it stands, the EIA is not useful because it provides little information about the hydrology of the site beyond noting the underlying formations contain a good amount of water and that the stormwater management plan includes infiltration systems to offset the loss of recharge on the site. Smiley (2015) refers to the Bishop Tube industrial site only by claiming the project would be a benefit to the area by removing the contamination and taking down the old building which is a visual issue for the area.

The proposed residential development includes a remediation plan that targets excavation of impacted soils from three discrete areas (Figure 7). Environmental Standards (2017, p 4-4) proposed excavating soils with more than 500 ug/kg of TCE but not deeper than bedrock or saturated conditions. The proposed excavation would include 10,788 tons of soil (Environmental Standards 2017, p 4-2), rather than the 16,511 tons previously proposed (Environmental Standards 2016b, p 4-2). I have not seen any more recent updates based on the revised plan.

There may be additional contaminated areas at the site, as the PADEP has identified from depositions from former Bishop Tube Company employees. "Information obtained from some of these witnesses has suggested that certain areas of concern, not previously fully characterized, may be contributing to contamination at the former Bishop Tube property"⁶. As discussed above, there has been substantial TCE contamination found northeast of the site along Little Valley Creek. If Bishop Tube is the source, the evidence of high TCE concentrations so far offsite demonstrates the risk the site poses for downstream locations. Until onsite contamination is fully located and characterized, developing the site as proposed would likely cover or otherwise render inaccessible these new identified contaminated areas.

TCE sources will remain until removed or leached out. Removing the sources by excavating buildings and soils could cause short-term releases from disturbances. Allowing the materials

⁶ Letter from Armstrong DA and Staron R, PADEP to Martin GD, Roux Associates, Re: Bishop Tube Site, Concluding Remedial Investigation Activities, dated September 27, 2018.

to remain in place and slowly leach out would take a long time and the site would be a long-term source.

Environmental Standards (2016a) responded to numerous PADEP concerns regarding the plan in ways that indicate the site would not be adequately remediated before development:

- PADEP requested sampling outside of the three identified AOCs so that CDP could remove additional contaminated saturated soil. CDP claims that any contamination outside of the AOCs would be “associated with TCE migration due to groundwater flow” and that CDP will not “chase impact in saturated soil resulting from migration of TCE in groundwater” (Environmental Standards 2016a, p 4). This means that TCE will remain in place and a source of TCE far into the future.
- PADEP noted that past investigations have shown TCE concentrations exceeding 500 ug/kg go far below 12 feet bgs, but the documents state that CDP will not excavate below 12 feet bgs because that “extends well in to the saturated zone at the three AOCs” (Id.). Environmental Standards claimed that “it is not CDP’s intent to achieve Act 2 standards in saturated soil, which is clearly a groundwater issue” (Id.) They claim that CDP has “satisfied its remedial obligations at the Site pursuant to a Consent Order” (Id.). They also claim that the current proposed excavation “goes far beyond the legal obligation” at the site (Id.). Environmental Standards notes in Comment 17 that “CDP has no obligation to remediate saturated soils and will not do so, aside from excavating saturated soils below the planned unsaturated soil excavations. The proposed remove ... is a voluntary act on the part of CDP ...” (Environmental Standards 2016a, p 6). CDP is clearly arguing that even this excavation is beyond their responsibility. Their refusal will assure that TCE in groundwater at the site will continue to be a source far into the future.
- CDP also refuses to consider whether backfilling with clean gravel would “exacerbate migration of contaminants in groundwater or subsurface vapors” (Id.) because they will install “vapor mitigation systems” (Id.) in nearby structures. The issue is that clean gravel will cause there to be a vapor pressure gradient established between the remaining contaminated soil and the clean gravel. The gradient could establish transport to the clean gravel and if the sources have TCE in them, they may no longer be clean. If there is residual TCE in the unsaturated soil, this could distribute TCE back through the clean gravel such that the site could be as much of a source after excavation as before.

As noted above, the site might install infiltration systems to offset the loss of recharge at the site. The revised site plan (Figure 7) shows infiltration systems along the north side of the development. There is no discussion as to the purpose of these infiltration systems. Additionally, removing the existing structure would remove substantial impervious surface from the site, although the development of townhomes and roads/parking area to support them would be impervious. The development would change the distribution of recharge at the site but the question of whether the amount would change is not answerable based on comparison

of the proposed site plan with the existing structure. A substantial increase in recharge could change flow patterns and cause more contaminant to transport to LVC.

Before the site is developed, the extent of the plume should be accurately mapped. The changes in recharge caused by developing the site should be modeled using the fate and transport model discussed above. Only by modeling the proposed changes is it possible to assess how the proposed development will affect groundwater flow and contaminant transport from the site. In addition to using the model to assess the existing plume, the model should be used in predictive mode to simulate how the plume would grow through time with and without the proposed townhome development. The model could also simulate needed remediation, such as extraction wells, for each potential alternative. This could determine the needed well layout on the site, and whether it is even possible with the townhome development.

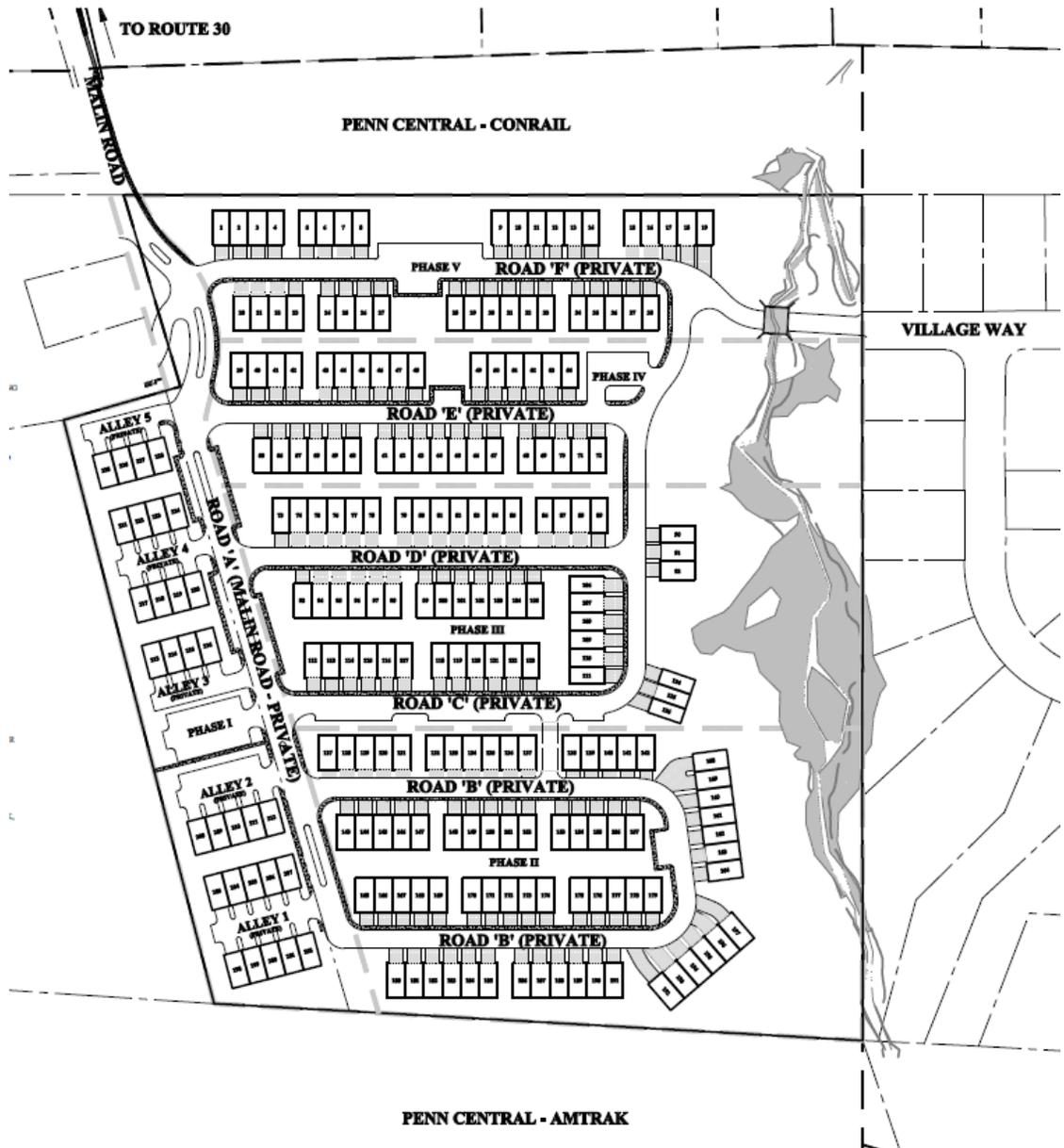


Figure 6: Original Preliminary Land Development Plan for Malin Road Development, including 228 townhomes. Source: Sheet 1 of 43, Inland Design (2017)

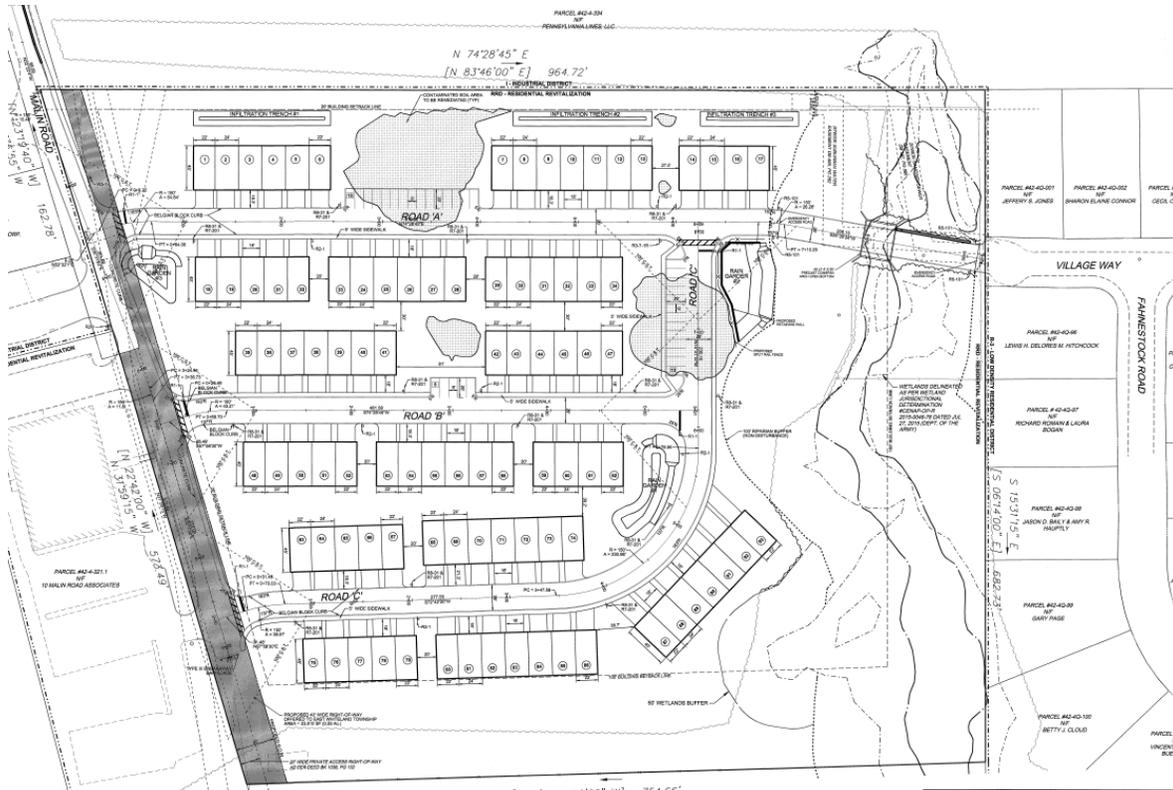


Figure 7: Revised Malin Road Development, including 93 townhomes. The grey areas in north, east and central portion of the site represent contaminated soil. Source: Sheet 4 of 24, Taylor Wiseman and Taylor (2018)

The proposal would violate several standards of relevant zoning requirements in ways that would harm the environment, contrary to the intent of the zoning regulations (§200-57A). Excavation and development at the site could cause “potential hazards to life and property” and disrupt the “ecological balance” by causing increased runoff, erosion, and sediment with contaminated soils, including those contaminated with TCE (§200-57A(2)). Significant erosion of contaminated soils could result in contaminated deposits that would cause the Township to spend funds to remediate, in violation of §200-57A(3). Excavation would add contaminants to the groundwater and downstream waters in the following ways, all of which are contrary to the zoning regulations:

1. Simply excavating the soil will create more surface area for seepage to contact and leach contaminants. If removal occurs slowly or areas are disturbed but not removed, excavation could create a short-term increased source.
2. Future backfills change the amount of seepage reaching the bedrock. This could change the rate of transport through the bedrock. TCE held in shallow fractures will continue to be a source.
3. Heavy excavation equipment could become a temporary source. Mud sticking to equipment could have high amounts of TCE contained in it.

Conclusion

Chlorinated solvents contaminating soils and groundwater beneath the Bishop Tube Superfund Site have been a risk to human health and ecosystems in the Valley Creek watershed since at least the 1980s. Large quantities have been bound to unsaturated soils at the site and have been leached into groundwater. It is found more than 300 feet bgs in bedrock fractures because of its high density.

Characteristics of TCE and related products cause it to remain at the site and slowly dissolve into groundwater. Because the contaminants are toxic at extremely low concentrations, the unremediated site will continue to be a hazard for the foreseeable future. Contaminants can pass downstream through surface waters from LVC to Valley Creek and the Schuylkill River or through groundwater by transporting with groundwater flow through bedrock fractures to points of discharge, including springs or streams. It is likely that not all discharge points to surface waters have been identified. Contaminants also can pass offsite as dust.

Developing this site would expose the existing contamination to wind and rain which would cause it to erode and pass downstream or downwind where it would contaminate additional areas. Also, much of the contamination would remain in place, especially in groundwater and soils outside of the targeted excavation zone. Other than the additional contamination caused by water and wind erosion, this residential development and remediation will expose substantial amounts of contamination that would be left in place to increased erosion. The development would not contribute substantially to the necessary remediation of downstream and downgradient resources.

The current proposed plan is smaller than the previous plan, but its effects on the contamination at the site and throughout the watershed would be the same. There is no evidence that the proposal has considered future remediation of groundwater, regardless of who would complete it, at the site.

PADEP has properly requested a numerical FTM be completed for the site to facilitate the delineation of a plume. A predictive numerical FTM is necessary not only to delineate the existing plume but also to predict its movement in the future, with and without the proposed development. A model should be completed and used to design necessary remediation. This must be done before any development occurs so that options are not lost due to a townhome being built where an extraction well is necessary.

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