Bamberg Creek, Jananna, and Koch-Leis Municipal Drains 2023 Expert Report

June 19, 2024

Prepared for:

TOWNSHIP OF Wilmot

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Re: Bamberg Creek, Jananna, and Koch-Leis Municipal Drains 2023
Township of Wilmot
Our Reference No. WLMT-002

EXECUTIVE SUMMARY

This expert report by Stephen Brickman, P.Eng., of Headway Engineering, delves into the specific issues posed by the Referee regarding the drainage project on the Jananna property within the Bamberg Creek and Koch-Leis Municipal Drains area. The primary focus of this analysis is on the identification of the Area Requiring Drainage (ARD), the validity of the petition, the application of specific clauses of Section 4 of the Drainage Act, and the compliance of the engineering report with subsection 8(1) of the Drainage Act.

Key Issues Addressed:

Area Requiring Drainage: The ARD is specifically identified within the Jananna property (Lot 10, Concession 3, Block B), which faces several distinct drainage challenges. External waters entering from the east and north present unique issues that necessitate management under the Drainage Act. Additionally, there is a pressing need for a legal outlet on the east side of the property, which addresses another crucial aspect of the area's drainage requirements. Moreover, an existing tiling system and the proposed West Branch drain into a maintenance-intensive system that cannot naturally improve and thus requires intervention under the Drainage Act. Neighboring properties, enhanced by natural drainage capabilities and their riparian relationship with Bamberg Creek, do not require additional Drainage Act intervention.

Validity of the Petition: The petition dated April 26, 2021, meets the requirements of Section 4(1)(a) and (b) of the Drainage Act. It facilitates a legally mandated investigation that revealed the necessary drainage improvements on both the east and west sides of the property. Supported by a majority of landowners within the ARD, the petition fulfills the statutory requirements for initiating drainage works, and the ensuing investigation justifies the proposed solutions as essential and compliant with the Drainage Act.

Justification for the West Branch: The necessity for the West Branch Drain emerges from a comprehensive analysis conducted during the Drainage Act investigation. Originally included, but not detailed in the preliminary documents, this need became evident as the assessment of water flows and maintenance requirements were revealed. The West Branch is crucial for effectively managing the drainage challenges on the west side of the property, ensuring that the entire drainage system functions efficiently. This apparent addition was always implicit in the project's scope, intended to provide a comprehensive solution to the property's drainage issues.

Compliance with Subsection 8(1) of the Drainage Act: The engineering report adheres strictly to subsection 8(1) of the Drainage Act, including detailed plans, profiles, specifications, and a comprehensive cost estimate for the proposed drainage works. It thoroughly assesses cost allocations among affected parcels and ensures necessary landowner allowances are

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considered, meeting all legislative requirements and ensuring the project's comprehensive legal and technical robustness.

This executive summary serves to outline the essence of the detailed report that follows, which includes in-depth analyses, discussions, and justifications for each aspect of the project. The full report ensures that stakeholders are well-informed of the technical and legal bases of the proposed drainage works, reinforcing the commitment to high standards of practice, community welfare and protecting landowner rights.

CONTENTS

EXECUTIVE SUMMARY I

1.0 INTRODUCTION 1

2.0 BACKGROUND INFORMATION 1

3.0 GENERAL APPROACH TO DETERMINING AN AREA REQUIRING DRAINAGE (ARD) 4

4.0 DETERMINING THE ARD FOR THE JANANNA PETITION 19

5.0 EXPERT OPINION ON THE VALIDITY OF THE PETITION 29

6.0 EXPERT OPINION ON AUTHORITY TO WORK ON THE KOCH-LEIS DRAIN 32

7.0 THE COUNTER POSITION 33

8.0 COMPLIANCE WITH THE DRAINAGE ACT 34

9.0 CONCLUSIONS 35

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1.0 INTRODUCTION

I am Stephen Brickman, P.Eng., President, and Project Manager at Headway Engineering. I have extensive experience in carrying out the duties of the Drainage Engineer appointed on Drainage Act projects. My educational background includes a Bachelor's Degree in Civil Engineering from Lakehead University (2012), and an Advanced Diploma of Civil Engineering Technology from Conestoga College (2009), complemented by specialized training in Municipal Drainage from the Ontario Ministry of Agriculture, Food, and Rural Affairs (2010).

Throughout my career, I have been deeply involved in the planning, design, and execution of numerous drainage projects demonstrating a thorough understanding of rural and urban watershed management, hydrology, and hydraulic functions. This expertise has enabled me to develop solutions that effectively balance agricultural development needs with environmental considerations.

The purpose of this Expert Report is to provide a detailed analysis and expert opinion on the determination of the Area Requiring Drainage (ARD) for the Bamberg Creek, Jananna, and Koch-Leis Municipal Drains project. This report will address the methodologies employed in defining the ARD, assess the physical and legal considerations impacting drainage requirements, and respond to the concerns raised by the appellant regarding the project's scope and execution.

My qualifications and professional experiences underline my capacity to offer informed, accurate assessments in complex drainage matters. This report aims to clarify the technical and regulatory foundations guiding the ARD determination, ensuring a comprehensive understanding of the project's objectives and compliance with the Drainage Act.

As a licensed Professional Engineer in Ontario, my practice is governed by the highest standards of academic rigor, ethical conduct, and professional accountability. Achieving licensure signifies that an engineer has not only met stringent educational requirements but has also gained extensive experience under the mentorship of seasoned professionals, successfully passed examinations focusing on ethics and professional practice, and commits to ongoing professional development. This includes both the acquisition and dissemination of knowledge within the field, as well as adherence to annual ethics modules as part of the Professional Engineers Ontario (PEO) Practice Evaluation and Knowledge Program.

This framework ensures that licensed engineers are equipped to contribute expertly and ethically to our fields, upholding public safety and welfare in all aspects of our work. While licensure distinguishes the professional qualifications of engineers, it is with respect and acknowledgement of the expertise and roles of all individuals involved in this matter, including those without an engineering background, that this report is presented.

2.0 BACKGROUND INFORMATION

2.1 Location

The project is situated in the Township of Wilmot, with the proposed works located south of Regional Road 12 (Gerber Road). The liable watershed area encompasses parts of Lots 9 to 10 in Concession 3, Block B, in the Township of Wilmot, and extends into parts of Lots 6 to 8 in Concession 2, Eastern Division, as well as part of Lot 8, Concession 3, Eastern Division in

the Township of Wellesley. The nearest urban centre, Wellesley, is located less than five kilometres to the west.

2.2 Drainage System Overview

The Drainage system comprises four distinct features:

1. **Jananna Drain (East Branch):** Approximately 598m of concrete and HDPE pipes, generally flowing southerly to its outlet into Bamberg Creek.
2. **Jananna Drain (West Branch):** Encompassing approximately 760m concrete and HDPE pipes, this branch also flows in a southerly direction to its outlet into the Koch-Leis Drain.
3. **Koch-Leis Drain:** This open ditch spans approximately 2.3km, with proposed works focused on the lower 551m, beginning at the West Branch outlet and extending downstream to Bamberg Creek.
4. **Bamberg Creek:** This creek serves as the eventual outlet for all the proposed works included in this drainage system. Bamberg Creek stretches approximately 14km beginning near Bamberg in the Township of Wellesley, and extends downstream to its confluence with the Nith River, just upstream of Phillipsburg in the Township of Wilmot. The proposed works in Bamberg Creek include approximately 650m of open ditch cleanout, ensuring adequate depth and grade to convey flows safely.

Continuing from Bamberg Creek's outlet into the Nith River, flows continue approximately 125km downstream until reaching the Nith River's confluence with the Grand River in Paris, County of Brant. From Paris, the flows are conveyed further downstream for approximately 140km to the Grand River's outlet near Dunnville in Haldimand County, eventually discharging into Lake Erie.

2.3 Statute Framework and Drainage Act Requirements

This section explains the structured process mandated by the Drainage Act for the initiation, assessment, and execution of drainage projects, specifically focusing on the determination of the ARD. The following outlines key sections of the Act related to the ARD, detailing the procedural steps from petition filing to Council consideration. The content is organized in a table format, with entries listed chronologically.

Step No.	Drainage Act Reference	Actor/Stakeholder	Description
1	Section 4(1) and 4(2)	Petitioner	The process begins with a petitioner filing a petition, specifying an initial ARD on the prescribed form.
2	Section 5	Council	The Council's acceptance of the petition leads to the appointment of an Engineer.
3a	Section 8	Council	Council appoints an Engineer tasked with accurately determining the ARD.
3b	Section 8	Engineer	Where the appointed engineer is a corporation, then the corporation must designate the individual engineer.

4	Section 9	Engineer and Landowners in the ARD noted on the Petition	The Engineer conducts an on-site meeting. One of the purposes of the meeting being to determine the actual ARD, and to evaluate the petition's validity. If valid, an engineering report is mandated. If invalid, steps to rectify are advised.
5	Section 42	Council	The report is deliberated by the Council in a Meeting to Consider. This meeting also serves as a platform for adjustments to the petition's support, affirming its validity and the project's progression, or initiating project closure, if validity has changed.

2.4 Documentation of Compliance with Drainage Act Procedures

In this section, I document the critical milestones of this project in accordance with the required steps as outlined in the Drainage Act. Each entry in the forthcoming table will correlate specific actions taken by various stakeholders with the corresponding sections of the Act, providing a timeline of how statutory obligations were met.

This documentation serves not only as a testament to the project's procedural integrity but also as a chronological account of the careful and lawful progression from the project's inception to its current status. The following table includes dates and references to official documents.

Step No.	Drainage Act Reference	Actor/Stakeholder	Description	Date Completed	Document Reference
1	Section 4(1) and 4(2)	Petitioner	Filing a petition, specifying an initial ARD.	April 26, 2021	Engineer's Productions beginning Page 76
2	Section 5	Council	Council's acceptance of the petition.	May 17, 2021	Township Productions Tab 13
3a	Section 8	Council	Appointment of the Engineer.	July 12, 2021	Engineer's Productions beginning Page 83
3b	Section 8	Engineer	Designation of the individual Engineer.	July 22, 2021	Engineer's Productions beginning Page 89
4	Section 9	Engineer and Landowners in the ARD noted on the Petition	On-Site Meeting to determine ARD and evaluate petition's validity.	September 22, 2021	Engineer's Productions beginning Page 128 & 141 & 150

5	Section 42	Council	Council's Meeting to Consider the Engineer's Report.	June 26, 2023	Township Productions Tab 181

3.0 GENERAL APPROACH TO DETERMINING AN AREA REQUIRING DRAINAGE (ARD)

3.1 Evolution of Drainage Statute

The evolution of Ontario's drainage legislation has been profoundly influenced by the diverse needs of Landowners and Municipalities over nearly two centuries. From its inception with the 1835 'Act to Regulate Line Fences and Watercourses', this body of law has continually adapted providing a framework to enhance land productivity and manage water resources effectively. These early legal foundations set the stage for the drainage practise we see today.

Early Legislation:

As noted, in 1835, the "Act to Regulate Line Fences and Watercourses" was the first drainage statute in Ontario. This statute enabled Landowners to enhance drainage on swampy lands and recoup costs through legal means.

Municipal Involvement and Petitions:

By 1859, the Act Respecting the Municipal Institutions of Upper Canada enabled municipal Councils to oversee drainage installations upon receiving majority Landowner petitions, marking the beginning of municipal involvement in drainage decisions, and the petition concept.

The role of determining the area which a petition's validity is to be measured against has historically oscillated among various stakeholders, leading to confusion and inconsistent implementations in the early years. This prompted legislative refinements, notably the Ontario Drainage Act of 1868, which primarily served as a financial arm of drainage projects by bridging Landowners to financial loans. In 1869, the petition requirements of the Municipal Institutions Act were further modified by allowing non-resident owners and owners to become petitioners, whereas prior to 1869, only resident owners were allowed to be petitioners. Additional definition was added to specifically identify those listed on the last revised assessment roll. Also, in 1869, the Ontario Drainage Act adopted the petition requirement included in the Municipal Institutions Act.

In 1877, the petition requirements of the Municipal Institutions Act were revised by requiring a two-thirds majority if pumping, or other mechanical operations were required.

In 1883, the Ditches and Watercourses Act (which replaced the Line Fences and Watercourse Act in 1874) allowed for abutting landowners to enlarge or improve a drain without the need for a petition or an Engineer. If an agreement between landowners could not be reached, then an Engineer would be appointed to arbitrate an award. The following year, in 1884, this Act was amended to require that every ditch or drain that is constructed under this Act be taken to a sufficient outlet.

Consolidation and Modernization – 1894:

Significant confusion about who precisely should determine the area which a petition's validity is to be measured against, and who should then determine if the petition represents a majority of Owners led to the 1894 consolidation of the statute into the Municipal Drainage Act. It should be noted that other points of confusion also precipitated the production of a new piece of legislation. This Act began to shape the modern approach by emphasizing the role of professional engineers or professional Ontario Land Surveyors in assessing and reporting on drainage needs, recognizing, and attempting to ensure that decisions were grounded in technical expertise rather than administrative discretion.

It is made evident at this point in history that there were strong opinions on the need for engineering expertise. This was a very common tension throughout the development of drainage law in Ontario. The Municipal Drainage Act required an engineer, while the Ditches and Watercourses Act only required an engineer if agreement could not be met. In 1903, in an apparent attempt at compromise, the Municipal Drainage Act required 'Drainage Viewers' to be appointed to assist the Engineer with their duties throughout the reporting process. The Drainage Viewers were to be local residents in the municipality. In 1910, any mention of Drainage Viewers was expunged from the legislation.

Consolidation and Modernization – 1962-63:

In the early 1960s, recognizing the need for a more streamlined and unified approach to drainage legislation, the Ontario government formed a Cabinet Committee tasked with reviewing and consolidating existing laws. By 1962-1963, this committee focused on harmonizing six major pieces of legislation:

1. Municipal Drainage Act
2. Ditches and Watercourses Act
3. Interprovincial Drainage Act
4. Municipal Aid to Drainage Act
5. Provincial Aid to Drainage Act
6. Tile Drainage Act

The consolidation led to the Drainage Act, which absorbed the first five Acts listed above and retained core petition requirements similar to those in the Municipal Drainage Act. This pivotal reform aimed to simplify the legal landscape.

This legislative consolidation streamlined drainage management significantly, reducing the complexity of compliance and improving consistency across Ontario. By blending multiple acts into the Drainage Act, the government provided a clearer, more accessible framework for Municipalities and Landowners, which facilitated quicker and more equitable resolutions to drainage issues.

Modernization – 1975:

The Drainage Act underwent several more changes to refine the responsibilities and procedures, including the central role that engineers play in the process. In 1975, following a report prepared by the Select Committee on Land Drainage, the statute was clarified by

explicitly stating that the area requiring drainage is to be determined by the appointed engineer, as is the validity of the petition. This shift ensured that determinations were made based on technical expertise, supported by legal frameworks that allowed for an appeals process, thus maintaining a balance between professional assessment and community recourse.

Summary:

The following table summarizes some key historical moments in the evolution of the Ontario Drainage Statute with respect to petition validity.

Year	Statute	Discussion
1835	Line Fences and Watercourses Act	Initial drainage statute to construct a drainage system between properties, and a mechanism for recovering costs.
1859	Municipal Institutions Act	Municipal Council involvement in drainage decisions, and initiation by Landowner Petition.
1869	Municipal Institutions Act and Ontario Drainage Act	The Municipal Institutions Act amended the petition requirements to account for non-resident owners. The Ontario Drainage Act adopted the petition requirements noted in the Municipal Institutions Act.
1877	Municipal Institutions Act	Added an additional two-thirds criteria if the drainage solution required mechanical features like pumps.
1894	Municipal Drainage Act	Petition validity determined by Municipal Council, but upon the report of an Engineer. This is also the first time where the petition validity was to be determined based on "area of land requiring drainage". This also introduced the Meeting to Consider the Report, and the mandatory step of checking the validity of the petition at this meeting.
1962-63	Drainage Act	This Act essentially adopted the same validity criteria as the Municipal Drainage Act (majority, or two-thirds majority for pump and embankment projects).
1975	Drainage Act	Petition validity revised to what we see today in Section 4: (a) majority in number, or (b) 60% in area, or (c) road authority, or (d) Director The Engineer is explicitly assigned the responsibility to determine the Area Required Drainage (Section 9).

Conclusion:

The historical evolution of drainage legislation in Ontario, culminating in the comprehensive Drainage Act, highlights a deliberate progression toward more effective and equitable water management practices. This legacy of continuous refinement has ensured that modern drainage systems not only address the complex challenges of today's land use, but also uphold the principles of fairness and technical precision established over the decades. The evolution reflects a commitment to integrating professional engineering insights into public policy, which has crucially shaped the application of drainage statute today.

3.2 Historical Referee Decisions

In this section, I outline how historical referee decisions have influenced the technical understanding and application of the Area Requiring Drainage (ARD) and the validity of petitions within the field of Drainage Act engineering. This review traces the evolution of key concepts from the initial 'saucer' definition through the progressive inclusion of land use and legal outlet considerations, emphasizing the increasingly central role of the engineer. My focus is on demonstrating how these decisions have shaped modern engineering approaches to determining the ARD, guiding my assessments and designs.

Early Decisions and the "Saucer" Concept

The earliest decision I reviewed is **Duane v. Finch (1908)**. This foundational decision emphasizes the importance of accurately representing drainage areas within petitions. Referee Henderson highlighted the need for petitions to be grounded in factual, physical assessments of the land, ensuring that the described drainage area is proportionate to the planned drainage scheme.

> *"It is still necessary, as it always was necessary, that the petition should describe a real drainage area, which should bear some reasonable proportion to the size and extent of the drainage scheme."- Duane v. Finch (1908), p.4.*

In my engineering assessments, this historical perspective guides the detailed field investigations I undertake to define ARDs. It ensures that the designs and recommendations I provide are not only technically sound but also appropriately scaled to the physical reality and drainage needs of the area.

In 1929, Referee Henderson introduced the concept of the ARD resembling an "irregularly shaped saucer with well-defined banks." This description was initially communicated not through formal legal decisions but in a letter to a clerk.

> *"There should be what I generally speak of as an irregularly shaped saucer with reasonably well-defined banks around it."*

In my current practice, I use the concept to aid in preliminary assessments but ensure detailed technological analyses follow. This approach acknowledges the concept's historical value while ensuring that modern engineering solutions are based on comprehensive data and contemporary standards, not solely on metaphorical descriptions.

Petition-Defined ARD Priority

The **McKeen v. East Williams (1966)** decision is an important point in the history of drainage engineering, highlighting the challenges faced when engineers propose solutions that extend beyond the areas initially petitioned. This decision illustrates the evolving understanding of the engineer's role in addressing broader water management needs, which at the time, were constrained by the parameters of the petitions.

> *"The engineer may validly report a scheme which includes additional lands over and above those described in the petition. In a proper situation, the engineer's report may properly recommend a more costly scheme, even one which proceeds to a different outlet." – McKeen v. East Williams (1966), p. 10.*

> *"In my view, this was not the purpose of the petition and I am not aware of any authority which would permit an engineer to substitute his views as to what is good for an area for his instruction." – McKeen v. East Williams (1966), p. 11.*

In current practice, this historical context informs a more nuanced approach where I ensure that any expansion of a project's scope is well-justified with clear technical reasoning and backed by comprehensive assessments. This ensures that while addressing broader environmental and hydrological needs, the solutions remain grounded within the permissible scope defined by regulatory and legal considerations.

Emphasis on Physical Characteristics and Engineer's Role

The **Westendorp v. Elisabethtown (1986)** decision is notable for highlighting how engineering responsibilities in Drainage Act process have evolved due to changes in legislation. This case emphasizes the transition in responsibility for determining the ARD from local councils to engineers, reflecting a broader trend towards leveraging technical expertise in environmental management.

> *"The present legislation suggests there is an area as described in the petition and further suggests there may be a second area requiring drainage as determined by the engineer, the latter to form part of his report." – Westendorp v Elisabethtown (1986) p. 5.*

> *"The definition of the area requiring drainage in the Petition was often only a guess on the part of the petitioners and more importantly by the local council who had to decide if a majority had signed." – Westendorp v Elisabethtown (1986) p. 10.*

> *"The major changes in the Drainage Act, R.S.O. 1970, c. 136, and the present statute I believe are the result of earlier court decisions that required the discretion of the initiating council and its continuing frustration and inability to define the area requiring drainage as described in the Petition." – Westendorp v Elisabethtown (1986) p. 10.*

This decision has significantly influenced modern engineering approaches, emphasizing the need for precise, data-driven assessments in drainage projects. It guides the development of methodologies that consider both physical geography and hydrological needs comprehensively. In my practice, this translates to conducting thorough site analyses to ensure our engineering solutions are effective and comply with current legislative standards.

The **Jones v. Derby (1986)** decision clarifies the approach for defining the Area Requiring Drainage (ARD) beyond initially petitioned areas, emphasizing the importance of consistent physical characteristics.

> *"I am of the view that it is the intention of the present Drainage Act that lands not described in the petition as requiring drainage that are subsequently found to require drainage by the engineer in his report to have similar physical features so as to form one area requiring drainage within those lines described in the petition as requiring drainage." – Jones v. Derby (1986), p. 10.*

In practice, this involves thorough investigations to confirm consistency in hydrological and geographical characteristics. This ensures robust and sustainable drainage solutions that adhere to proven engineering principles.

Incorporation of Land Use Considerations

The **Hodgson v. Mariposa (1993)** decision underlines the importance of accounting for specific physical characteristics and land use in determining the ARD.

> *" I would add that in determining the area requiring drainage that there should be some physical characteristics which is different where the proposed drains ends from that of the surrounding area. This could be the extent of the grade, the kind of cropping that is taking place in the area, or other physical characteristics." – Hodgson v. Mariposa (1993), p. 4.*

This decision directs engineers to assess land use and unique environmental characteristics, ensuring that drainage designs are optimally tailored to the specific conditions of each area.

The decision **Pannabecker v. West Wawanosh (2000),** highlights the autonomy given to engineers in determining the ARD, asserting that their professional judgment is paramount, even when it diverges from the initial petition.

> *"It is equally important to note that in the current Drainage Act the decision as to what lands are the lands 'requiring drainage' is left solely to the appointed Drainage Engineer who is available to give a professional opinion." - Pannabecker v. West Wawanosh (2000), p. 7.*

This decision highlights the importance of relying on detailed engineering assessments and land use evaluations. It supports engineers in making informed decisions based on their professional expertise, ensuring that drainage solutions are both technically sound and contextually appropriate.

In **M&M Farms v. Kingsville (2004)**, the court amended the saucer shape and emphasizes its limited relevance in modern farming and highlighting the need to consider physical characteristics, land uses, and legal outlets when determining the ARD.

> *"It should be noted that statement was made by the Referee in 1929 in a period when the horse was still the primary source of energy on the farm. Farms were small, tile drainage was limited and modern contouring practices (with the use of lasers and G.P.S.) were totally unknown. It becomes harder and harder to apply the saucer concept to the context of modern farming and it has no application*

whatsoever if the only requirement is to obtain a legal outlet when one is not available." - M&M Farms v. Kingsville (2004), p. 12.

"He must act professionally and honestly when confronted with modern farming methods that completely alter the landscape, creating circumstances that were never contemplated in previous generations and he must adjust to current needs to keep the Drainage Act relevant." - M&M Farms v. Kingsville (2004), p. 13.

This decision guides engineers to adapt their methods to modern practices, incorporating advanced technologies and updated land use considerations. It reinforces the need for professional and honest assessments that account for modern landscapes, ensuring that drainage solutions remain relevant and effective.

In Brzeczka v. Niagara-on-the-Lake (2022), the referee upheld the determination of the ARD and the validity of the petition but noted errors in the report, instructing it to be corrected.

"The concept of land use has emerged as well as a guide to drainage engineers…It should be noted that 'the lands requiring drainage' the decision must not only evaluate the objective physical condition of the lands in question, but also must examine the land use factors, all of which together must be weighed in determining which lands require drainage" – Brzeczka v. Niagara-on-the-Lake (2022), Paragraph 75.

This decision highlights the need for engineers to integrate land use considerations alongside physical assessments when determining an ARD. It emphasizes comprehensive evaluations that balance both environmental and land use factors to ensure accurate and effective drainage planning.

The Melidy v. Holland Marsh (2023) decision highlighted the necessity for meticulous and independent engineering assessments in drainage disputes. The referee found that the appointed engineer did not adequately use the information provided by the petitioner, leading to an invalid petition.

“[The engineer] did not use the topographical data and contour map provided by [the petitioner] because he, [the engineer], had not done that topographical survey. He said he had perused the 2004 topographical information provided by [the petitioner] to the Tribunal about the elevations of the rear yard of the [neighbour’s] property at 126 Ondrey Street but did not use any of that information in his determination of the area requiring drainage.” – Melidy v. Holland Marsh (2023) Paragraph 48.

"[The engineer] made no on-site measurements to confirm the GIS information and made no inquiries of [the petitioner] about what parts of the 126 Ondrey Street rear yard were referred to by [the petitioner] when he gave evidence to the Tribunal." – Melidy v. Holland Marsh (2023) Paragraph 45.

This decision highlights the need for engineers to conduct thorough, independent investigations and ensure that all relevant data, including historical and current conditions, are considered. It emphasizes the importance of accuracy and impartiality in engineering evaluations to support reliable legal and regulatory decisions.

Conclusion:

The evolution of referee decisions has progressively refined the criteria for determining the ARD, reflecting several key developments in drainage engineering practices and legal frameworks.

Duane v. Finch (1908): This early decision focused on the necessity for petitions to describe a real drainage area proportionate to the drainage scheme's size. It provided foundational guidelines emphasizing the natural topography, for defining drainage areas.

McKeen v. East Williams (1966): This decision highlighted the limitations of the engineer's role before the 1975 legislative changes. At that time, the petition-defined ARD carried more authority than the engineer's expanded design. It emphasizes the importance of adhering to the petition's original scope, reflecting the legislative constraints of the period.

Westendorp v. Elisabethtown (1986): Marking a significant shift, this decision emphasized the legislative evolution that placed the responsibility of defining the ARD onto the engineer. It reinforced the necessity of basing the ARD on physical features and acknowledged the challenges faced by local councils before the legislative changes, emphasizing the engineer's crucial role in determining the ARD.

Jones v. Derby (1986): This decision reaffirmed the "saucer" concept and emphasized that lands not described in the petition but found to require drainage by the engineer should have similar physical features to form a cohesive ARD. It highlighted the importance of consistent physical characteristics across the ARD.

Hodgson v. Mariposa (1993): The referee in this case added the consideration of land use in determining the ARD, evolving the criteria beyond just physical characteristics.

Pannabecker v. West Wawanosh (2000): This decision stressed that the ARD determined by the engineer can differ from the petition, highlighting the paramount importance of the engineer's professional judgment. It underscored the authority of the engineer's assessment over the initial petition descriptions.

M&M Farms v. Kingsville (2004): This decision marked a significant development by amending the saucer shape's applicability, incorporating modern agricultural practices, and emphasizing the necessity for legal outlets in defining the ARD. It acknowledged the need to adapt to current farming methods.

Brzeczka v. Niagara-on-the-Lake (2022): This decision highlighted the importance of a thorough and accurate assessment by the engineer, integrating physical characteristics and land use. It reinforced the need for comprehensive evaluations to ensure accurate and effective drainage planning.

Melidy v. Holland Marsh (2023): The referee in this case emphasized the importance of careful and independent engineering assessments. The decision highlighted the need for engineers to provide precise and well-supported investigations of the ARD, ensuring that evaluations are based solely on professional expertise and factual evidence.

The historical trajectory of referee decisions demonstrates an increasing complexity and sophistication in defining the ARD. The evolutions include:

- **Shift in Responsibility:** Initially, ARD determination was primarily the responsibility of the council. Over time, this responsibility has shifted to the Engineer, as recognized in various decisions, particularly Westendorp v. Elisabethtown (1986).
- **Evolving Criteria:** The criteria for ARD determination have evolved from focusing solely on physical characteristics (Duane v. Finch) to incorporating land use (Hodgson v. Mariposa) and, more recently, legal outlets and modern practices (M&M Farms v. Kingsville).
- **Modern Adaptations:** The outdated "saucer" concept has been replaced with general criteria that reflect current agricultural and environmental practices, ensuring that the Drainage Act remains relevant (M&M Farms v. Kingsville).

These decisions highlight the critical importance of the engineer's professional judgment in creating effective and compliant drainage schemes. By integrating physical, land use, and legal considerations, engineers ensure that drainage solutions meet contemporary needs and statutory requirements, reflecting the dynamic and evolving nature of drainage engineering.

3.3 Engineering Considerations and Criteria for Determining the ARD

This section details the engineering principles and criteria fundamental to my determination of Areas Requiring Drainage (ARDs). The complexity of each drainage issue requires an adapted approach, guided by the specific characteristics and challenges presented by the scenario. This section outlines various real-world scenarios encountered in my professional experience, illustrating how differing drainage challenges influence the definition and scope of ARDs. These scenarios cover a broad range of situations, they are not exhaustive; unforeseen circumstances may require unique assessments and solutions.

Erosion Problems

Erosion issues commonly involve channels, flow paths, or surface conveyance features such as ravines, which are characteristically longer than they are wide and exhibit significant slopes. These features may cross through or act as natural boundaries between properties.

Common ARD Shape: The ARD for erosion issues tends to be linear, reflecting the primary direction of flow along the feature. This linearity may span multiple properties, which can influence the validity of the petition based on how the feature interacts with property lines.

Property Boundary Implications:

- Feature as Property Line: If the erosion feature is also a property line (e.g., a natural severance like some ravines or a side yard swale in urban areas), the ARD will typically include both properties equally. For the petition to be valid, it generally requires signatures from owners on both sides of the feature.
- Feature Independent of Property Line: If the erosion feature crosses property lines but is not aligned with them, the engineer must conduct a detailed assessment to determine the start and end points of the feature, and further identify the length of the feature on each affected property, and the proportion of the feature affecting each property. Petition validity will then be calculated based on the length of the feature on each property and whether the petition is signed by a majority of owners or represents 60% of the affected area (length).

Land Use Considerations: Land use around erosion features is usually consistent, with both sides of the feature often utilized for similar purposes. This uniformity means that land use considerations typically have less impact on defining ARDs in erosion scenarios, as the physical characteristics and the configuration of the land are more dominant factors.

Flooding Problems

Flooding issues predominantly occur in low-lying areas that lack adequate drainage infrastructure. Such areas often exhibit characteristics similar to the previously mentioned irregularly shaped saucer, gathering water during significant rainfall or snowmelt events.

Common ARD Shape: The ARD for flooding issues generally adopts an irregular, expansive shape that captures the entirety of the low-lying area prone to water accumulation. This shape is dictated by natural land depressions and the existing inadequate drainage capacity.

Land Use and Risk Receptors: Flood-prone areas often involve diverse land uses, each with different risk levels:

- Residential Areas: Backyards and communal spaces where flooding can directly impact living conditions and property.
- Passively Used Agricultural Lands: These include lands not regularly farmed but susceptible to water logging, affecting their use.
- Intensively Used Agricultural Lands: Areas where persistent water can damage crops or disrupt farming activities.
- Infrastructure: Roads and access routes in these areas are critical, especially if needed for emergency access, contrasting with less critical access to undeveloped or unoccupied lands.

Sector-Specific Considerations:

- Agricultural Settings: The widespread adoption of farm tile drainage systems across Ontario has significantly mitigated traditional flooding issues on agricultural fields. These systems, necessitate secure outlets to effectively manage water, shifting the focus from managing surface water to managing outlet from these systems.
- Residential and Built-Up Areas: In contrast, residential areas, urban settings, and roads do not typically benefit from tile drainage solutions, maintaining the relevance of traditional and simplistic surface drainage infrastructure to address flooding.

Saucer Shape Application: While the concept of a saucer-shaped ARD may still be valid, its practical application is minimal to non-existent in areas where tile drainage is prevalent or could be effectively implemented. In such contexts, the challenge often shifts from managing standing water to ensuring adequate outlets for farm tile drainage systems.

Lack of Usability

Issues of lack of usability may arise in areas that do not necessarily experience flooding but fail to meet current drainage standards or optimal land use requirements. These issues might involve enhancing land usability through interventions such as under-drainage, particularly in agricultural or developmental contexts.

Common ARD Shape: The ARD for usability issues often corresponds to the regular, geometric shapes of agricultural fields or planned development areas. The characteristics of these areas, whether highly sloping or notably flat, dictate the nature and extent of drainage solutions required. On the other hand, soil type may significantly influence usability issues. Areas with naturally well-draining soils may not require extensive under-drainage, leading to a potentially irregular ARD boundaries where only specific sections of a larger area might need intervention.

Landowner and Engineer Collaboration:

- Landowner Requirements: The level of usability required is often initially determined by the landowner, who assesses what modifications are necessary to meet their usage goals.
- Engineer's Role: The engineer's responsibility is to evaluate the landowner's requirements for reasonableness. This assessment includes respecting the landowner's desires while applying professional judgment to ensure that the proposed drainage solutions are practical, sustainable, and representative of today's drainage standards.

Boundary Implications: The boundaries for ARDs in the context of usability often align with property lines or the distinct outlines of agricultural fields or development areas.

Legal Outlet

The need for a legal outlet arises when drainage solutions must be compliant with property boundaries. This is often a critical consideration in areas where adjacent properties may have differing access to natural or established drainage outlets.

Common ARD Boundaries:

- Property Lines: Property boundaries play a significant role in determining the need for a legal outlet. One property may have direct access to a natural drainage feature, such as a watercourse or sewer system, while an adjacent property does not.
- Sub-catchment Watershed Delineations: The boundaries of sub-catchments within a watershed are crucial in planning drainage, as they determine how water flows across different properties and where interventions might be necessary.

Implications for Change in Land Use: The requirement for a legal outlet is particularly significant in projects that aim to change land use to more intensive or commercially focused purposes. A change in land use may vary from a simple land improvement, to development which often involves substantial investments and fundamentally alter how land interacts with surrounding water systems.

Engineer's Role:

- Assessment of Requirements: Engineers must carefully assess the specific drainage needs of a land use change/enhancement, considering both the scale of the investment and the local impact of the proposed changes.
- Navigating Legal and Technical Constraints: It is essential for engineers to navigate both the legal stipulations regarding water discharge and the technical challenges posed by the site's geography and existing infrastructure.

Conveyance of External Flows

In drainage engineering, managing external water flows—particularly sheet flows and uncontained flows—is a complex issue, as downstream landowners are not legally obligated to accept these flows under common law. Although technically within a landowner's rights to block such flows, this is not considered a sustainable or realistic solution.

Common ARD Shape: The ARD in scenarios involving external flows is typically characterized by:

- Entry Point: The point where external flows first enter the property, often where there is no adequate pre-existing channel or pipe to manage or direct the water. This point of the ARD must logically be positioned at a property line. This placement is crucial to defining the scope of responsibility and potential interventions for managing these flows.
- Affected Area: The ARD may also encompass areas where the land has become less usable due to water damage or where modifications are necessary to create effective water conveyance designs.

Drainage Management

Drainage management plays a crucial role in wetland restoration projects, where the focus shifts from water conveyance to maintaining and controlling water levels to support some form of natural hydrologic function. The ARD in these projects is often defined not just by the land area but by the hydrological needs of the wetland.

Common ARD Shape:

- High Water Level Contour: The ARD is typically defined by a contour elevation that delineates the high water level expected or desired in the restored wetland. This contour helps in designing interventions that maintain water levels within the necessary ecological constraints.
- Irregular Shape: Given the nature of wetland landscapes and water movement, the ARD often takes on an irregular shape, closely following the natural topography and hydrological patterns of the area.

Other Instances and Emerging Scenarios

In the field of drainage engineering, new challenges arise as landscapes and community needs evolve. Recognizing that not all future scenarios can be predicted, each project must be assessed individually to accurately determine the ARD. This approach ensures that solutions are tailored to the specific conditions and requirements of each site, maintaining flexibility to adapt to unforeseen challenges.

When addressing these diverse and evolving scenarios, it is crucial to consider the long-term sustainability and legality of the drainage solutions. This involves evaluating the potential environmental impact, community needs, and regulatory compliance of any proposed interventions.

Permanence

The Drainage Act provides a robust framework for creating permanent drainage solutions that are legally sound and protected by by-law. This statutory support ensures comprehensive management of every aspect of a drainage system, including its design, improvements, maintenance, and cost-sharing.

Unlike private solutions, which may lack formal oversight and fail to guarantee long-term functionality, the solutions implemented under the Drainage Act are designed to be enduring. This permanence is a key advantage, offering property owners and stakeholders reassurance about the durability and functionality of their investments in drainage. Utilizing the Drainage Act for addressing an ARD not only resolves immediate issues but also lays a foundation for ongoing maintenance and improvements. This structured approach ensures that drainage solutions are robust, compliant, and adaptable to changing conditions over time. It also promotes communal responsibility and legal protection, emphasizing the superiority of statutory solutions over private interventions.

Spectrum of Importance for Land Use

The significance of land use in determining the Area Requiring Drainage (ARD) varies widely, depending on its function and the dependency of the landowners on that particular use. Here, I categorize land use into a spectrum of importance, ranging from critical to less critical, based on the urgency and economic impact:

Emergency Access: This is considered the most critical use of land. Areas designated for emergency access, such as routes to hospitals or emergency shelters, but also access to occupied dwellings during emergency events (such as floods) are prioritized to ensure unimpeded support during crises.

Enormous Investment: Land developed or earmarked for significant financial investment, such as commercial development projects, also ranks highly. The economic stakes involved demonstrate the importance of optimal drainage to protect and enhance the value of these investments.

Necessary Livelihood: This category includes lands that are essential for the landowner's income. Operational farmlands that requires adequate drainage to remain functional and profitable is an example.

Passive Livelihood: Areas that contribute indirectly to a landowner’s income, such as secondary agricultural areas, are important but do not demand the same level of urgency as the primary sources of livelihood.

Recreational Use: Land used for leisure activities, such as parks, or personal backyards, generally holds the least urgency. While important for quality of life, the drainage needs of these areas are often less critical and can be more flexible in terms of planning and implementation.

This spectrum helps guide engineers in prioritizing ARD determinations based on the functional importance of the land, ensuring that both the economic and social impacts of drainage decisions are carefully balanced. By understanding the varying degrees of importance across different types of land use, engineers can tailor their drainage solutions to align with the specific needs and priorities of the community and individual landowners.

General Principles

The determination of the Area Requiring Drainage (ARD) is the responsibility of the appointed engineer. The initial step in this process involves confirming whether the area specified in the petition indeed falls within an ARD. If this is the case, the subsequent task is to ascertain whether the ARD extends beyond the boundaries identified in the petition. This involves examining if the extended area encompasses additional properties, which may affect the scope and implications of the drainage project.

Identifying the drainage problem to be solved is crucial, as it helps define the ARD. This process involves the following steps:

Identify the Problem: Determine the specific drainage issue, such as erosion, flooding, lack of usability, need for a legal outlet, conveyance of external flows, or drainage management. This is the foundational step in the ARD determination process. Understanding the specific drainage issue, whether it's erosion, flooding, or another concern, directly influences all subsequent decisions. Correctly identifying the problem ensures that the solution addresses the actual needs of the area, preventing misallocation of resources and ensuring that the most pressing issues are prioritized.

Accurate problem identification helps define the spatial and functional scope of the ARD, guiding where and how the engineering solutions should be applied.

Discuss with Petitioners: Engage with petitioners to understand their concerns and verify if they align with physical features and real or proposed land uses. Engaging with petitioners, and other landowners, is crucial for gathering firsthand information about the drainage issues from those directly affected. This dialogue helps validate the presence of the problem within the context of real-world use and perceptions, ensuring that the engineering solutions align with the actual needs of landowners.

Assess Physical Features: Examine the physical characteristics of the area to identify the extent and nature of the drainage problem. The physical assessment provides a tangible basis for all technical decisions in the drainage plan. Understanding the topography, soil type, existing flow paths, and other geographical features is essential for designing effective and sustainable drainage solutions.

This technical evaluation defines the natural boundaries of the ARD, ensuring that the engineer's work is tailored to the physical reality of the landscape.

Consider Land Use: Evaluate the land use within the ARD, considering current and reasonable future uses. Land use analysis is essential for contextualizing the drainage solutions within the current and planned uses of the land. This step ensures that drainage plans enhance or at least do not negatively impact the economic and social activities dependent on the land.

By evaluating both current and reasonable future land uses, the ARD, when determined correctly, can protect and support economic development and land preservation, balancing growth with environmental sustainability.

Legal Considerations: Address legal considerations such as the need for a legal outlet and the conveyance of external waters without a legal obligation to accept them.

Property Lines as Legal Boundaries:

Property lines, though merely lines on paper, may hold significant real-world implications in the determination of the ARD. These lines define legal boundaries that can influence drainage solutions and responsibilities. For instance, a property with an established legal outlet allows for drainage within the entire watershed that falls within its bounds. However, if a portion of this property is later severed, the new property line creates a legal boundary for the severed portion, potentially altering its access to the original legal outlet.

In many cases, the ARD boundary may align with property lines, especially when different parcels of land have distinct legal rights or access to drainage facilities. This alignment can dictate where and how drainage systems are implemented, ensuring they comply with legal ownership and access rights.

While property lines may not manifest physically in the field, their role as legal boundaries may be crucial in the planning and execution of effective drainage systems. Engineers must consider these boundaries to ensure that drainage solutions are not only effective but also legally sound and respectful of property rights. This approach emphasizes the complexity of drainage engineering, where legal considerations are as impactful as the physical and hydrological characteristics of the land.

Conclusion

Determining the ARD is an intricate process that integrates deep technical expertise with a comprehensive understanding of legal, social, and environmental factors. Each drainage issue presents unique challenges, making it essential for engineers to adopt a highly tailored approach to each project. This process begins with a precise identification of the drainage problem, followed by active engagement with the stakeholders involved, particularly the petitioners. By thoroughly assessing the physical landscape, critically evaluating the land use impacts, and methodically considering legal boundaries such as property lines, engineers ensure that their solutions are not only technically sound but also legally compliant and socially responsible.

Engineers play a pivotal role in balancing the technical demands of drainage with the rights of landowners, ensuring that each solution respects property boundaries and legal precedents while effectively addressing the identified drainage needs. This careful consideration ensures that ARD determinations contribute to the sustainability and efficiency of drainage systems, providing equitable solutions that stand the test of time and adapt to evolving land-use patterns and environmental conditions.

Ultimately, the rigorous process employed in determining the ARD underlines the commitment to precision, fairness, and legal adherence, upholding the integrity of the engineering profession and ensuring that drainage systems enhance the welfare of the communities they serve.

4.0 DETERMINING THE ARD FOR THE JANANNA PETITION

4.1 ARD as Noted in the Petition

According to the petition, the ARD is noted as the following:

The area of land described below requires drainage (provide a description of the properties or the portions of properties that require drainage improvements):
N1/2 Lot 10, Concession 3B, 1184 Gerber Road

This initial identification sets the groundwork for a comprehensive evaluation to verify, and potentially expand or reduce, the areas designated in the petition. This process will involve rigorous field investigations, public consultations, and a detailed review of both the physical and legal aspects affecting the drainage requirements. By establishing the ARD as described in Section 3.3 of this report, we ensure a thorough assessment to accurately determine the full extent of the area that requires management under the Drainage Act. This ensures that all relevant areas are accurately captured.

4.2 On-Site Meeting – September 22, 2021

Preparatory Work and Initial Site Visit

Prior to the formal on-site meeting, preparatory work was conducted using publicly available information and Geographic Information System (GIS) techniques. This preparation involved analyzing aerial photos and digital elevation models (DEMs) to perform a detailed watershed delineation. On **August 24, 2021**, an initial site visit was conducted to confirm or adjust these boundaries and to identify stakeholders for the upcoming on-site meeting. This initial assessment was crucial to ensure that the subsequent on-site meeting would be grounded in accurate and comprehensive geographical data, aligning with the general methodology noted in Section 3.3, with an emphasis on appropriate data collection and analysis as a foundation for ARD determination.

On-Site Meeting

During the **on-site meeting** held on **September 22, 2021**, the prior GIS analysis was validated, confirming that the area designated in the petition genuinely required drainage. This validation process involved:

Identifying External Water Flows: The meeting emphasised the presence of external water flows onto the petitioner's land without a legal mandate for acceptance, confirming the need for drainage per the criteria outlined in Section 3.3, which focuses on the physical characteristics indicating drainage necessity.

Legal Outlet Considerations: It was identified that there exists an area that cannot be effectively tile drained due to the absence of a legal outlet, highlighting a critical aspect of ARD determination under Section 3.3—assessing the adequacy of existing drainage infrastructure.

Additionally, discussions during the meeting brought to light the need to further investigate the property's west side, a concern not pre-identified but emerged through stakeholder engagement:

West Side External Water Flows: Similar to the east side, the west side was experiencing uncontrolled external water flows. This finding prompted further investigations into whether

these conditions extended the ARD beyond the initially identified areas. It's clear that the petitioners face a legitimate drainage problem due to unpermitted surface flow from external lands, further aggravated by alterations such as a break in the road's ditch bank directing water directly onto their property. These alterations exacerbate the natural drainage problem, emphasizing the legitimacy of the petitioners' concerns and the necessity of addressing them within the project's scope. While acknowledging this, it's also recognized that the severity of this issue might not match other challenges on the property.

Review of Petition: A review of the petition confirmed that it correctly identified the property and had the necessary signatures, supporting the validity of the petition for further investigative processes.

Focus on ARD Verification

A focus of the on-site meeting was to verify whether the petitioner's property fell within an ARD:

East Side External Waters: A distinct ARD was identified on the east side where external waters continuously flowed over the ground surface, originating and concluding within the petitioner's property boundaries. This finding was critical as it directly tied to Section 3.3's criteria for establishing an ARD based on observable physical conditions that necessitate Drainage Act intervention.

Tile Drainage and Legal Outlet Needs: The discussion also covered the tiling that had been done and the areas that could not be 'pulled' to the southwest due to topographical limitations. This highlighted the high priority need for a legal outlet to manage the un-tiled areas effectively, emphasizing the necessity for a tailored drainage solution that could only be facilitated through a formal engineering report.

Conclusion and Further Actions

The conclusions reached during the on-site meeting of September 22, 2021, mark a critical phase in the ongoing determination of the Area Requiring Drainage (ARD). While the meeting conclusively identified specific sections of the petitioner's property as part of the ARD—highlighting areas affected by external water flows and insufficient drainage outlets—the investigation remains incomplete. The next essential step is to determine whether the ARD extends beyond the currently identified boundaries onto adjacent properties. This extension could have significant implications for the overall drainage project, potentially altering the scope and scale of necessary interventions.

Following the On-Site meeting

A phone call was received from an adjacent property owner (Cory Kittel) expressing opposition to the investigation of a proposed drainage solution. The feedback highlighted the difference between landowner requirements, where perceptions of necessity and the financial implications of solutions can vary significantly among stakeholders. This interaction highlighted the importance of balancing technical needs with the economic realities faced by Landowners.

4.3 Continued Investigation of ARD

Following the initial on-site meeting, further site visits were conducted to reassess the area. On October 12, 2021, a visit reaffirmed the initial conclusions. A subsequent visit on November 10, 2021 allowed for a comprehensive assessment of both the east and west sides of the site, confirming earlier findings. These visits were critical to verifying the project's needs and also ensuring that the proposed solutions were grounded in accurate, on-the-ground observations.

After the site assessments, a detailed topographic survey was conducted by our team on November 24, 2021. This initial survey aimed to gather precise data for design work. Upon reviewing this data and drafting initial designs, it became evident that additional surveying was necessary to identify a sufficient outlet for drainage. Consequently, a follow-up survey was carried out on December 23, 2021 to address this requirement and ensure the projects feasibility and effectiveness.

After completing and analyzing the survey data, we moved on to preparing models of the existing surfaces and design of the drainage system. Following this, we engaged with environmental agencies, and upon approvals, we estimated the project costs and determined cost distributions according to the Drainage Act.

Through the process, efforts were made to allow for the project's scope to potentially be reduced. During a meeting with the petitioners on September 13, 2022, we focused on the West Branch to discuss its associated costs and gauge their commitment to pursuing this aspect of the project. This discussion served as a crucial checkpoint for assessing the petition's validity concerning the west side. The petitioners reasserted their concerns over external water discharges onto their property, leading to the decision to maintain the proposed design solutions. This step highlights the consideration of stakeholder input and the necessity of addressing identified drainage issues within the project's scope, ensuring solutions align with the genuine needs and legal framework outlined by the Drainage Act.

4.4 Additional Public Engagement

During our engagement process, we held two public meetings; the first on September 29, 2022, and another on November 22, 2022. Despite ongoing dialogues with landowners, which suggested an underestimation or outright denial of the petitioner's drainage issues, and the community as a whole, our evaluations affirm the presence of genuine drainage concerns.

Significantly, following the first meeting on September 29th brought to light issues with the outlet for the west branch and the tiling system on the Jananna property. This information necessitated a reassessment of the ARD to consider these new challenges. As a result, the ARD was adjusted to account for the sophisticated yet maintenance-intensive drainage system, which outlets into a system experiencing excessive maintenance. This adjustment led to the expansion of the ARD, albeit still confined to the same property, reflecting the need for a more comprehensive solution as outlined in the upcoming report.

This expanded ARD synthesizes all identified areas into one ARD, encompassing the east side where external waters enter the property and where an area lacks a legal outlet, the west side which also receives external waters, and the tiling system whose maintenance issues have now been recognized as excessive, yet avoidable with the application of the Drainage Act.

The feedback from the September 29th meeting also led to a reduction in the scope concerning the Bamberg Creek, due to public input. Consequently, the second meeting on November 22nd was organized to address these adjustments and present the revised scope with the community.

The entire property at North 1/2 of Lot 10, Concession 3, Block B, 1184 Gerber Road, Wilmot Township, has been delineated as the ARD, excluding the bush areas and the naturally well-draining soils to the north of the property. These areas do not require drainage interventions, hence their exclusion from the ARD.

Efforts to explore private solutions for the drainage issue on the east side were made on **February 10th and February 13th, 2023**. The focus was on the east side's drainage issue, offering the petitioner a final opportunity to consider a private resolution, given the neighbour's promises to rectify the situation. There was skepticism regarding the neighbour's sincerity and concerns about the permanence of a private solution. Ultimately, the petitioner sought a solution with legal permanence, protected under by-law and the Drainage Act, ensuring long-term reliability. This decision maintained the ARD determination, emphasizing the petitioner's priority for a legally safeguarded resolution.

4.5 Determining the ARD Beyond the Petitioner's Property

Evaluating the extension of the Area Requiring Drainage (ARD) onto neighboring lands is essential for understanding its impact on the petition's validity and the overall drainage project. The Kittel property to the east features a distinctive low-lying, saucer-shaped area that is predominantly located on Mr. Kittel's side. This analysis will clarify whether the saucer is included in the ARD and determine if other features on the Kittel property should also be considered part of the ARD. This precise determination is crucial for ensuring the project's alignment with the Drainage Act and addressing any misconceptions that could affect its progression.

Riparian Rights and Legal Outlets

The Kittel property is positioned riparian to Bamberg Creek, affording it natural drainage rights that negate the necessity for interventions under the Drainage Act. This riparian status allows the property to legally manage water flow from the property directly into the creek without additional infrastructural requirements. Conversely, the Jananna property lacks such riparian benefits, placing it in a position where the Drainage Act becomes essential to establish a legally sanctioned drainage solution.

Mr. Kittel has acknowledged the adequacy of his property's drainage capabilities through correspondence stating,

> *"It has been confirmed by independent drainage designers and installers that a suitable outlet already exists and can be achieved without this work" (Page 653 of 1106 of the Engineer's Productions).*

This assertion not only demonstrates awareness of the property's advantageous position but also solidifies the fact that this property does not require the statutory interventions provided by the Drainage Act, unlike the Jananna property which is dependent on such legal provisions to achieve necessary drainage standards.

This clear distinction in legal drainage rights between the two properties highlights the necessity of the Drainage Act's involvement for the Jananna property to ensure it meets current drainage standards and legal requirements. It stresses the disparity in natural advantages and legal entitlements affecting the drainage strategies applicable to each property.

The Saucer Definition

The 'saucer' concept, which historically defined ARDs as shallow depressions reminiscent of a saucer's shape, originates from a time when agricultural technology and infrastructure were far less advanced. Referee Delbert A. O'Brien in his decision dated September 29, 2004, in the case of M & M Farms Ltd. vs. Kingsville, pointed out the limitations of this concept. He noted that this was a standard set in 1929, a period characterized by horse-driven farm operations, minimal tile drainage, and the absence of modern contouring practices such as laser leveling and GPS mapping.

> *It should be noted that statement was made by the Referee in 1929 in a period when the horse was still the primary source of energy on the farm. Farms were small, tile drainage was limited and modern contouring practices (with the use of lasers and G.P.S.) were totally unknown. It becomes harder and harder to apply the saucer concept to the context of modern farming and it has no application whatsoever if the only requirement is to obtain a legal outlet when one is not available. – M&M Famrs Ltd. V. Kingsville (2004), p. 12.*

Referee O'Brien emphasized that the context of modern farming has evolved significantly, rendering the saucer concept increasingly less relevant in agricultural settings. Today's agricultural practices include advanced tile drainage systems that are designed to efficiently manage water flow across varied terrains, far surpassing the capabilities of the simplistic saucer-shaped drainage solutions. In modern settings, the necessity for ARDs may revolve around having legal drainage outlets rather than conforming to a specific topographical shape.

In line with Referee O'Brien's insights, it is evident that the practicality of tile drainage in agricultural settings has largely supplanted the need for defining ARDs based solely on the saucer shape. This definition is more apt for scenarios where tile drainage technologies are absent, such as in residential areas, where simplistic natural surface relief still plays a critical role in water management.

Therefore, applying the saucer concept to the current context, particularly in well-equipped agricultural landscapes, is both archaic and deficient. The focus should instead be on ensuring adequate legal outlets and utilizing today's drainage technologies that adequately address the complex water management needs of current landscapes.

Clarifying Misuse of the Saucer Concept

The use of the 'saucer' shape as a defining feature for the ARD has been incorrectly emphasized regarding the drainage needs on the east side of the petitioner's property. As detailed in earlier sections of this report, the primary drainage issues identified involve external water flows and the critical necessity for a legal outlet—issues that are fundamentally unrelated to the simplistic topographical shape of a saucer.

The insistence on defining the ARD solely by this saucer shape incorrectly narrows the scope of the ARD. This strategy is particularly evident in efforts to limit the scope of required drainage interventions and possibly halt the progression of necessary drainage projects. By focusing on

a saucer-shaped depression, which is not a concern in this context, distracts attention from the broader and more pressing issues of water management and legal access to adequate drainage outlets.

It is critical to base the definition of the ARD on objective assessments of water flow, legal drainage rights, and the actual needs of the land, rather than outdated or inapplicable topographical definitions. The saucer concept does not address the complexities of modern drainage requirements or the specific challenges faced by the petitioner's property. Instead, a comprehensive evaluation of the property's drainage needs should guide the determination of the ARD, ensuring that all relevant factors are considered.

To stylize the ARD definition around the saucer shape is a simplification that undermines the integrity of the drainage analysis and the Drainage Act's provisions. It is essential to focus on the legitimate drainage issues that require resolution under the Act, thereby ensuring that the ARD determination is accurate.

Upstream Extent of the ARD

Recent assertions have brought up concerns regarding a potential extension of the Area Requiring Drainage (ARD) in the upstream direction on the East Branch. While this idea was introduced after the original report was filed, it merits consideration within the framework of the existing drainage project. It is important to clarify, however, that this area is not part of the actual ARD.

The central issue in the defined ARD is the continuous flow of surface water, which originates from the appellant's property. This situation requires a surface water drainage solution, including a properly designed inlet and outlet system. The event-based surface water flows from the petitioner's property are naturally directed towards this newly proposed drainage system. Extending the municipal drainage system further upstream is neither authorized, necessary, nor practical.

The construction of the proposed municipal drainage system offers a practical and effective way to manage event-based surface flows. This approach not only avoids the unnecessary costs and complexities of extending the drainage system upstream but also leverages the capabilities provided under the Drainage Act to address such issues locally and efficiently. The Drainage Act provides mechanisms for addressing such drainage scenarios without necessitating the extension of the main drainage works. These solutions allow for local management of surface flows, which is both economically sensible and legally sound. It highlights the Act's capacity to provide flexible, adaptive responses to specific drainage challenges without overextending the scope.

The assertion that the area in question should be included as part of the ARD does not align with the technical assessments or the practical requirements of the situation. The proposed drainage infrastructure is adequately designed to handle current and potential future needs, and its implementation is fully authorized and aligned with the needs of the real area requiring drainage that is further validated by petition. This emphasizes the necessity to proceed with the planned works where there is clear authority and obligation. This decisive approach ensures that drainage solutions remain focused, effective, and in strict compliance with statutory requirements and the practical realities of drainage management.

Investment in Necessity of Drainage Act Solutions

The Jananna property has made significant investments in drainage solutions, demonstrating a proactive approach to water management that aligns with modern agricultural standards. These investments include plans for incorporating municipal drains, which are essential for addressing the comprehensive drainage needs of the property. While the Kittel property, does not demonstrate the same drainage quality as the petitioner's property, this does not reflect a deficiency that necessitates the intervention of the Drainage Act. Instead, this property has the legal and technical capacity to achieve adequate drainage. The current state of drainage reflects individual choices regarding investment and land management rather than an inherent inability to achieve proper drainage.

As engineers, it is important to differentiate between drainage problems that necessitate the Drainage Act and problems that do not. The current state of drainage on the Kittel property reflects a decision or economic choice not to invest in additional drainage infrastructure, rather than an inherent deficiency that requires statutory intervention.

The autonomy of property owners in managing their land and infrastructure investments must be respected, provided that they have the legal means to achieve adequate drainage. The focus should remain on ensuring that any invocation of the Act is justifiably based on actual deficiencies that cannot be legally addressed privately, rather than compensating for a lack of investment.

Landowner Stance on Drainage Needs Before the Drainage Report Filing

Throughout the process of public engagement, Mr. Kittel has consistently expressed that there is no drainage problem warranting intervention. He has provided multiple pieces of information to support his claim that the issues previously affecting his land have been resolved through existing drainage measures implemented by neighboring properties.

In an email dated September 23, 2022, Mr. Kittel remarked,

> *"As you can see from the image attached, we have added that former wet spot back into our workable land. Since the neighbor tiled their fields, this area has completely dried up..." (Page 389 of 1106 of the Engineer's Productions).*

He further shared a photo with the Council and Township staff on May 12, 2022, with the caption:

> *"This is the lowest area in all the fields after a VERY snow heavy season and big melt. Zero standing water and drying/draining nicely. At the time of this photo, it's bone dry and being prepped for farming for the first time after overgrowth being cleared out. The result of successful field tiling recently placed in the ground nearby. This area is typically wet in March like with any low spots in fields (tiled or not) during the melt, drying by April and looking like this in May." (Page 643 of 1106 of the Engineer's Productions).*

Mr. Kittel has critiqued the proposed drainage solutions as excessive, labeling the $104,800 ‘East Branch’ of the project as a "band-aid solution" and "over-engineered" with no additional benefits for the lands it would affect. He asserts that this effort is redundant, stating the proposed solution:

> *“is trying to fix a problem that’s already been fixed.” (Page 651 of 1106 of the Engineer’s Productions).*

He also mentioned plans for a new private drain to be installed to manage any residual issues proactively:

> *“As mentioned earlier, a new private drain is to be installed by the pond owner (Kittel) to address the pond issue. Since this new drain needs to head South toward the creek anyway, it will be routed through the low depression with a drain in that area near the fence line to pick up any standing water if it were ever to become a problem.” (Page 651 of 1106 of the Engineer’s Productions).*

In a note to the petitioners on March 23, 2023, Mr. Kittel conveyed,

> *"The low depression doesn't seem to be a problem anymore anyway, your filed tiling took care of that, but a drain will be there anyway along the fence line just in case." (Page 583 of 1106 of the Engineer's Productions).*

The consistent theme in Mr. Kittel's communications is a clear indication that he perceives no current or future need for extensive drainage interventions under the Drainage Act for his property. This stance, supported by evidence of effective existing drainage and planned enhancements, suggests that the ARD, as defined by the Act, does not extend to include his property based on necessity. The focus thus remains on ensuring that any proposals under consideration are necessary, justified, and beneficial for the affected areas, taking into account the actual conditions and the perspectives of involved stakeholders.

Conclusion: ARD Assessment for the Kittel Property

The ARD must be rooted in one of the abilities of the Act, if it isn't, then the Act is not needed, or cannot work. Based on the engineering assessments and legal frameworks discussed, the Kittel property does not fall within the ARD in a manner that impacts the scope of this project. The property's existing legal rights to an adequate natural drainage outlet, combined with Mr. Kittel's consistent assertions that no additional drainage support is required, point out this conclusion.

Throughout the year and a half spent preparing this report, Mr. Kittel has repeatedly emphasized the sufficiency of existing drainage conditions on his property, negating the necessity for further action under the Drainage Act.

In contrast, the petitioner's property does require the interventions provided by the Drainage Act to achieve adequate drainage solutions. This property lacks the natural and legal drainage capabilities that the Kittel property benefits from, making the Act's provisions essential to address its specific and unmet drainage needs effectively.

This comprehensive evaluation indicates that while the Drainage Act remains a crucial tool for addressing significant drainage challenges, its application must be judiciously reserved for circumstances where it can effectively resolve issues that cannot be managed through existing legal or natural means. The Kittel property, with its adequate drainage capabilities and lack of substantive issues requiring statutory intervention, exemplifies a situation where the Act's involvement is not essential. However, for the petitioner's property, the Act is indispensable in ensuring legal and effective drainage solutions are implemented.

4.6 Meeting to Consider the Report

At the **Meeting to Consider the Report**, held on **June 26, 2023**, as outlined in Section 42 of the Drainage Act, petitioners and other landowners were given a crucial opportunity to amend their involvement in the petition. No changes to the names were requested. This juncture, effectively a point of no return, affirmed the seriousness with which the petitioners regarded their drainage issues, both east and west, and their determination to seek a long-lasting resolution under the legal protections offered by the Act.

5.0 EXPERT OPINION ON THE VALIDITY OF THE PETITION

A petition legally triggers a Drainage Act investigation. While the petition itself does not authoritatively detail the specific drainage needs, its filing obligates a comprehensive examination of the area's drainage issues. This investigation subsequently reveals the proposed drainage works. The petition effectively initiates the required legal and engineering processes to identify and address these needs, supported by a majority of landowners or 60% majority of the area within the professionally determined ARD, fulfilling the statutory requirements for initiating drainage works.

5.1 Petition Validity

The Drainage Act outlines specific criteria for the initiation of drainage projects through petitions filed by property owners or other stakeholders. This section assesses whether the petition for drainage on the Jananna property meets the necessary legal requirements specified in the Act, ensuring the project's legitimacy and compliance.

Criteria for Validity

Owner Participation and Majority Requirements: According to Section 4(1)(a) of the Drainage Act, a petition must be filed by the majority in number of the owners of the lands within the area requiring drainage as indicated on the last revised assessment roll. This includes owners of any roads within the area. The Jananna petition satisfies this requirement, as it has been signed by a majority of landowners within the ARD.

Representation of Land Area: Section 4(1)(b) specifies that the petition can be initiated by the owner or owners representing at least 60 percent of the hectare coverage within the ARD. The Jananna property, which encompasses the majority of the land within the ARD, meets this criterion, with the petitioners collectively owning more than 60 percent of the ARD.

Conclusion

The petition for drainage works on the Jananna property adheres to the stipulations of the Drainage Act, specifically Sections 4(1)(a) and 4(1)(b). The inclusion of a sufficient number of property owners (100%) and the representation of land area (100%) in the petition validate the initiation of the project for addressing the drainage issues comprehensively. As such, the petition is legally valid, and the project must proceed under the Drainage Act, ensuring that actions taken are within the framework of established legal requirements.

5.2 Discrepancy in the Petition's Supplemental Document and the Entire ARD

In the complex process of initiating drainage projects under the Drainage Act, the initial petition plays a crucial role in defining the scope of the proposed works. In this specific case, the petitioner formally identified the entire property as the Area Requiring Drainage (ARD) on the petition itself, warranting a broad approach to addressing potential drainage issues. Accompanying the petition was a supplemental document that provided further detail by focusing primarily on the east side of the property. This document presented a more detailed overland flow path and suggested a possible design concept for that specific area.

The west side of the property was first brought to attention during the onsite meeting, reflecting a broader concern than initially indicated by the supplemental sketch. This inclusion was consistent with the petitioner's formal declaration of the entire property as the ARD, highlighting a discrepancy between the inclusive scope of the petition and the more focused

description of the supplemental document. Such a situation stresses the dynamic nature of drainage evaluations, where initial documents may not fully capture the evolving understanding of a property's drainage needs.

This section examines the implications of these document discrepancies and how they influence the project's legal and practical considerations, particularly considering the petitioner's broader request during the onsite meeting to include the west side in the investigation—a request validated by their initial comprehensive identification of the ARD.

Supplemental Documents in Drainage Petitions

The Drainage Act utilizes a prescribed petition form to initiate drainage projects, ensuring consistency, fairness, and uniform treatment across the province. This petition form is designed to meet statutory requirements, providing a standardized approach that facilitates equal application of the statute to all stakeholders. This standardization is essential in maintaining transparency and predictability in how drainage issues are handled, which is essential for both the administration and the practical execution of engineering projects under the Act.

While supplemental documents may be submitted alongside the prescribed petition to provide additional context or detail about the proposed drainage works, their role is informative rather than determinative. These documents can include sketches, descriptions of specific problem areas, and sometimes, design concepts. They do not and cannot constrain the scope of a project. Should they do so, it would disconnect the project from essential technical assessments and professional standards, allowing petitioner assumptions or preferences to predominate improperly.

Though supplemental documents provide valuable insights and can help articulate the petitioner's concerns and perceived needs, they must be understood as supplementary to the engineer's authoritative determination of the ARD. The use of prescribed forms ensures consistency across the province, and the role of the engineer in defining the ARD ensures that drainage projects are grounded in professional assessments rather than subjective interpretations of drainage needs. This framework not only respects historical legal developments but also aligns with modern expectations, ensuring that they are conducted with a high degree of technical and legal rigor.

Role of Referee Decisions in ARD Determination

Since 1975, there has been a significant shift in how the ARD is determined, moving from reliance on petitioners' assumptions to detailed technical analysis by engineers. This change has allowed for more precise and objective engineering assessments, which directly influence the design and scope of drainage projects.

Notable is the **1986 Westendorp v. Elizabethtown** case. This case illustrates the practical implications of engineers taking a lead role in defining drainage projects. It highlights that engineering decisions, while initially differing from petition descriptions, are based on rigorous technical analysis of physical and environmental data.

> *"The definition of the area requiring drainage in the Petition was often only a guess on the part of the petitioners and more importantly by the local council who had to decide if a majority had signed." – Westendorp v Elisabethtown (1986) p. 10.*

> *"In defining an area to be drained in a petition, absolute certainty is in most instances impossible. An adequate definition of a drainage area in most instances is not possible until the report of the engineer is prepared since it is dependent upon the topography and the variation of ground levels. In essence, the initial area set forth on the petition may increase or decrease, dependent upon the professional determination of the engineer." Westendorp v. Elisabethtown 1986, p. 11*

The 2000 Pannabecker v. West Wawanosh decision highlights the technical responsibility placed on engineers, emphasizing the importance of their independent, professional judgment in the assessment of the ARD based on objective criteria, rather than the less precise methods previously used.

Here's the exact quote from the decision:

> *"It is equally important to note that in the current Drainage Act the decision as to what lands are the lands 'requiring drainage' is left solely to the appointed Drainage Engineer who is available to give a professional opinion. In previous legislation, that decision was left to the municipal council which no doubt gave expression to a lay opinion, possibly influenced by political considerations. The current Drainage Act, which imposes on the Drainage Engineer the duty to provide independent, unbiased professional opinions, represents a positive step forward and in many cases, the Drainage Engineer gives expression to the needs of minority landowners." Pannabecker v. West Wawanosh 2000, p. 7*

These decisions emphasize the critical role of engineers in advancing drainage design through objective, technical assessments. Moving away from initial guesses and subjective assessments, engineers now rely on precise, data-driven evaluations. This shift ensures that drainage solutions are sustainable and effective, rooted in modern environmental and technical standards.

Significance of Signatures and Property Identification

Beyond the initial ARD description, the validity of a drainage project under the Drainage Act critically depends on the signatures collected from property owners within the accurately determined ARD. These signatures—and the properties they identify—ensure that the project is legally backed by those truly requiring drainage by the proposed drainage works, affirming legal compliance and the protection of property rights.

The names on the petition and the corresponding properties they identify are crucial components of a valid drainage petition. The initial ARD description serves as a starting point, but it is the engineer's professional assessment that ultimately defines the precise ARD. What matters most are the property owners' signatures, indicating their petitioning action for the drainage project.

This focus on property identification ensures that the drainage project addresses the needs of landowners who require the Drainage Act's intervention to achieve today’s drainage standards. The petition's validity is not tied to the ARD initially described but to the confirmed action from property owners within the engineer-determined ARD. This approach ensures fairness, compliance with the Drainage Act, and the alignment of the project's scope with the actual requirements of the landscape.

Emphasizing the importance of signatures and property identification protects the legal rights of landowners to achieve modern drainage standards. This focus ensures that minority landowners' rights are safeguarded, providing them with the necessary infrastructure to manage water effectively and maintain their properties' value and usability. The drainage project, therefore, is not about popularity but about ensuring legal protection and equitable access to essential drainage solutions.

6.0 EXPERT OPINION ON AUTHORITY TO WORK ON THE KOCH-LEIS DRAIN

The Koch-Leis Drain is a municipal drain established in 1950. While it has not been improved under Section 78 of the Drainage Act, it has undergone periodic maintenance in 1985, 2010, 2012, 2018, and 2021. Despite these efforts, maintenance needs at the lower end have been increasing significantly. Current surveys, when compared to the original 1950 drainage report, reveal that the condition of its outlet, the Bamberg Creek, has substantially deteriorated.

Under Section 15 of the Drainage Act, there is a clear obligation to ensure that the drainage outlet is sufficient. The Act states:

> *Subject to section 32, every drainage works constructed under this Act shall be continued to a sufficient outlet. R.S.O. 1990, c. D.17, s. 15.*

Initially, the depth of the Koch-Leis Drain led me to believe it provided a sufficient outlet for the drainage works. However, insights shared by the Drainage Superintendent, particularly maintenance records presented after the first public information meeting, highlighted significant issues. These records indicated that the outlet was requiring excessive maintenance, which, coupled with the flat grade and deterioration in Bamberg Creek, demonstrated that the current outlet was insufficient and could not improve naturally.

The work on the Koch-Leis Drain is, therefore, mandated by the need to secure a sufficient outlet as required by Section 15 of the Drainage Act. This requirement supersedes the need for a separate Section 78 authorization. The improvements are essential to ensure an effective and sustainable drainage system for the Area Requiring Drainage (ARD).

Interestingly, the work in Bamberg Creek, extending upstream to the outlet of the east branch, is justified under Section 15 of the Drainage Act, rather than under Section 4, which served as the initial authority. While Section 4 and a valid petition initiate a project, the design scope of the project is ultimately determined by the ARD (upper constraints) and the need for a sufficient outlet (lower constraints). The drainage network between these constraints forms the 'municipal drain.'

This approach ensures that all necessary improvements are made to achieve a sufficient and legally compliant drainage system, addressing both immediate needs and long-term sustainability.

7.0 THE COUNTER POSITION

In every petition I review, and every ARD I determine, I always test the position: what are the implications if I deem the petition invalid? This exploration is vital to understanding the potential consequences for the lands identified on the petition and the ARD as I have determined it.

7.1 Legal and Practical Implications

Validity of the Petition:

An incorrectly expanded ARD could potentially affect the validity of the petition. According to Section 4 of the Drainage Act, for a petition to be valid, it must be supported by a majority in number of the owners or by owners representing at least 60% of the land area within the ARD. An expanded ARD might include properties that do not require drainage solutions or whose owners did not consent to the petition, raising questions about the petition's legitimacy.

Impacts on Petitioned Lands:

If the ARD includes lands unnecessarily, the biggest issue for properties that rightfully need drainage is the potential loss of their legal rights to adequate drainage solutions. These rights, once forfeited due to an incorrect ARD determination, may become exceedingly difficult to recover, leading to a ripple effect where more properties might be deprived of essential drainage solutions. Additionally, incorrect determinations may perpetuate the discharging of surface water onto downstream properties, compelling them to accept flows they are not legally required to manage.

Engineer's Authority and Professional Responsibility:

An incorrectly determined ARD not only undermines the engineer's authority but also the integrity of the Drainage Act itself. The determination must align with the principles outlined in the Drainage Act and be supported by legal precedents. Ensuring that the ARD is correctly determined upholds the engineer's credibility and the legislative intent of providing a fair and equitable solution to drainage issues.

7.2 Upholding the Act’s Objectives and Professional Standards

Protection of Legal Rights:

The Drainage Act serves not only to resolve drainage issues but also to protect the legal rights of landowners to access the abilities provided by the Act. An accurate ARD determination is crucial for safeguarding these rights and ensuring that properties that legally require drainage interventions are not overlooked or disadvantaged by the influence of those who do not require such interventions.

Professional and Technical Basis:

Another key objective of the Drainage Act is to provide drainage solutions based on professional and technical assessments, ensuring that all properties that qualify under the Act's provisions receive appropriate drainage solutions. The Act aims to eliminate the influence of public opinion or dissent (instead of public need) that may hinder the implementation of necessary drainage projects. The engineer’s responsibility is to ensure

that the solutions are not only technically sound but also legally compliant, reflecting the needs based on a thorough and professional analysis.

Conclusion: Ensuring Accurate ARD Determination

To mitigate the issues outlined, it is imperative to maintain a rigorous and analytical approach in determining the ARD. This process begins with a precise identification of the drainage problems, followed by an assessment that is strictly based on technical data and professional judgment, not swayed by public or neighborly pressures.

Thoroughly analyzing the counter position emphasizes the necessity of precise and legally sound determinations of the ARD to prevent the loss of legal drainage rights and ensure that all actions taken under the Drainage Act enhance the welfare of the communities they serve while adhering to the highest standards of fairness and technical precision. Ensuring that the ARD is accurately determined is fundamental to upholding the integrity of the engineering profession and the legal framework of the Drainage Act.

8.0 COMPLIANCE WITH THE DRAINAGE ACT

This section demonstrates the drainage report's compliance with the requirements set forth in Section 8 of the Drainage Act, along with additional obligations as prescribed by related Drainage Act sections. The engineering efforts, methodologies, and documentation presented herein align with statutory mandates, ensuring that the proposed drainage works are legally sound and technically robust.

8.1 Compliance with Section 8 of the Drainage Act:

Section 8(a) Plans, Profiles, and Specifications, and Description of the ARD:
The report contains six detailed drawings that provide comprehensive plans, profiles, and specifications of the drainage works.

Section 2 of the drainage report discusses the ARD and the validity of the petition, while Section 5 elaborates in broader terms, offering a clear and detailed description of the findings.

Section 8(b) Estimate of the Total Cost:
The total estimated cost of the drainage project is thoroughly detailed in Section 14 of the report, ensuring transparency and facilitating financial planning and cost-sharing among stakeholders. Additional detailed breakdowns of the costs are included in Schedule 'A' Schedule of Allowances, and Schedule 'B' Schedule of Estimated Construction Costs.

Section 8(c) Cost Assessment:
Schedule C methodically outlines the cost distribution by branch and assessment instrument, clearly detailing the financial responsibilities of each parcel of land and road for benefit, and outlet liability.

Section 8(d) Allowances for Land Owners:
Schedule A specifies the allowances to be paid to landowners affected by the drainage works, categorized by drain segment and allowance category, providing for fair compensation for disturbances and damages.

Other Prescribed Matters (Section 8(e)):
The report addresses additional statutory requirements, including environmental considerations, future maintenance of the drain (detailed in Schedule D and Sections 10, 12

of the report), and other structural and operational provisions necessary for the implementation of the drainage works.

8.2 Further Legal and Technical Compliance:

Pipe Systems Capacity (Section 14), Sufficient Outlet (Section 15), and Disposal of Material (Section 16): Design considerations (Section 6) and Special Provisions (Division H) ensure all technical aspects from pipe capacity to material disposal are handled according to current construction practices and legal standards.

Structures and Access (Section 18): Loss of access and the impact on crossings have been assessed, with appropriate measures and compensations detailed in Section 12.1 of the report.

Fair and Impartial Reporting (Section 11 of the Drainage Act): The drainage report has been prepared with utmost fairness and impartiality, adhering strictly to the professional standards required under the Act.

8.3 Conclusion

The drainage report fulfills all the prescribed requirements under the Drainage Act. The thorough attention to statutory details and the professional execution of engineering duties stress the reliability and legal soundness of the drainage solutions presented.

9.0 CONCLUSIONS

This Expert Report has rigorously examined the petition for the Bamberg Creek, Jananna, and Koch-Leis Municipal Drains project under the strict guidelines of the Drainage Act. The findings detailed herein affirm that:

Definition of the Area Requiring Drainage (ARD):

The ARD is identified as part of the Jananna property (Lot 10, Concession 3, Block B) and is notably influenced by external waters entering from both the east and north sides. Additionally, there is a critical need for a legal outlet on the east side. The outlet for the existing tiling system, along with the proposed West Branch, requires extensive maintenance that can only be effectively addressed through Drainage Act intervention. Neighboring properties, in contrast, are enabled by natural drainage features, such as their riparian relationship with Bamberg Creek, which inherently supports their drainage needs without the need for further intervention under the Drainage Act. This expertly defined ARD stresses the necessity for targeted actions confined to the Jananna property.

Validity of the Petition:

The petition is validated under Sections 4(1)(a) and 4(1)(b) of the Drainage Act, backed by a comprehensive engineering report that meets all the required legal and technical standards. The ARD, correctly identified as part of Lot 10, Concession 3, Block 'B', supports the implementation of necessary drainage works. This validation supports the scope of the drainage works as proposed, confirming that the petitioned area requires enhanced drainage solutions and the application of the Drainage Act. My conclusions are deeply rooted in both technical rationale and legal precedents, ensuring that the decisions made are not only scientifically sound but also legally robust. This dual foundation protects the rights of landowners and aligns with the procedural and substantive requirements of the Drainage Act.

West Branch Works:
The requirement for drainage works on the west side was inherent to the project's overall needs from the beginning. Although initial documentation and assessments provided a disproportionate focus on the eastern side, thorough investigations revealed the critical nature of addressing the western side as well. This revelation was not the result of a change in project scope but an unmasking of existing conditions that were always part of the comprehensive drainage strategy. The original petition inherently encompassed the necessary authority to undertake this work, affirming that no amendments were required to address these longstanding needs. This realization ensures that the entire scope of the project is understood as a cohesive and pre-authorized effort to enhance drainage efficiency across the Jananna property.

Compliance with Section 8(1) of the Drainage Act:
My report comprehensively addresses all requirements of subsection 8(1) of the Drainage Act. It includes detailed plans, profiles, specifications of the drainage works, accurate cost estimates, and a thorough assessment of cost allocations among affected parcels. This thorough documentation demonstrates full adherence to statutory mandates and confirms the project's legal and technical robustness.

Engineer's Adherence to Duties:
My role as the Drainage Engineer has been performed with diligence and fidelity to the principles of the Drainage Act. This included conducting an intensive review of the ARD, multiple site visits, and a comprehensive assessment of pertinent data. Additionally, the separation of genuine drainage needs from public dissent has been a critical aspect of my responsibilities, ensuring that decisions are made based on technical merit and legal rights rather than community sentiment. Throughout this process, the emphasis has been on upholding the rights of landowners by focusing on legitimate technical and legal drainage requirements. This approach safeguards landowner rights and ensures that drainage solutions are just and necessary.

The engineering decisions taken have been informed by a solid understanding of the Drainage Act and augmented by insights from historical referee decisions, ensuring that all actions are grounded in precedent and the spirit of the law.

Closing:
This report not only reinforces the technical and legal bases of the proposed drainage works but also highlights the commitment to preserving the rights and welfare of the landowners while adhering to the highest standards of engineering practice. The Drainage Act, with its robust framework, ensures that landowners receive fair and necessary drainage solutions, preventing the loss of their legal rights and promoting equitable water management practices.

By maintaining these rigorous standards, we ensure that drainage works under the Drainage Act not only resolve immediate water management issues but also provide sustainable, legally sound solutions that serve the community's long-term needs.

Respectfully submitted

[redacted]

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