



CASE IN POINT 2009

Sewage Infrastructure

Development and the Red River Corridor

CONTRIBUTORS

Becky Raddatz
Department of City Planning, University of
Manitoba

Lloyd Talbot, MCIP
Selkirk District Planning Board

*Sewage
treatment
can be used
as a planning
tool to direct
and support
development*

ABSTRACT

The area between Winnipeg and Selkirk along the Red River is home to over 46,000 people living in 4000 homes which use private wells for drinking water, and septic systems for sewage treatment. This corridor, including the five municipalities of Selkirk, East St. Paul, West St. Paul, St. Andrews and St. Clements surround the Red River which empties into Lake Winnipeg.

These municipalities have acknowledged a growing environmental and public health risk of the increasing population and high use of private wells and septic systems along this water body, and the aquifer and came together to form the Red River Infrastructure Committee (RRIC). Concurrently, Selkirk is framing its draft development plan around these same principles. The municipalities are attempting to address this growing sewage and water quality problem through the planning, placement, and management of sewage treatment systems, and the direction of new development to piped areas.

Sewage treatment and piped service can be used as a planning tool to direct and support development according to comprehensive plans, to protect environmentally sensitive areas, and as an integrated part of an overall sustainable development system. The Selkirk Draft Development Plan and this inter-municipal cooperation through sewage treatment represent cutting edge practice in regional planning.

Background

Located in the South East portion of the Interlake District, this planning area consists of five municipalities which all border the Red River. The total population of the Selkirk and District Planning Area is 35 000 people with an annual growth rate of 1 percent. The main type of population growth is intraprovincial from Winnipeg and other areas. Within the medium growth rate projections, the population is expected to grow by 8200 people over the next twenty years. The primary land use in the area is agricultural, but this is not the main source of employment for residents. The area consists mostly of flat terrain with clay soils, which leads to poor drainage. Much of the subdivision development in this area has occurred along the river front with the majority of new homes employing septic fields.

Facts of the Case

There has been a proliferation of rural residential development and conversion of farmland to residential in the planning district. This type of development is more expensive for municipalities in the long term due to the need for the provision of improved services. Many of these septic fields which were built 30 years ago are failing, and causing human and environmental damage. Septic fields are characterized as poorly functioning, especially on the river lots along the Red River in heavily developed areas. In 1999 there were 200 confirmed cases of failed septic systems in St. Andrews and St. Clements alone. There is a correlation between failed fields and e. Coli and coliform found in wells. According to the Selkirk and District Planning Area Development Plan Background report “If any reasonable value is placed on public health and on environmental capital such as watersheds and the aquifer, an economic analysis will show that on-site disposal systems have no place in the study area under the present development parameters.”

The Selkirk Planning area has been shown to be an inappropriate area for decades. In 1970 Lombard North Group conducted the St. Andrews Environmental Impact Assessment Study in which it stated “All things considered, it would be difficult to find an area less suitable for “on site” sewage disposal systems than the study

area.” Reasons given were the heavy clay soils, non-existent natural drainage, and cold weather preventing adequate microbial action.

Recognizing these concerns, the municipalities banded together to form the Red River Infrastructure Committee (RRIC) to develop an approach by way of piped services that would be implemented over the next several years. With financial support from the Planning Board and the province a conceptual business plan was prepared by an independent consultant.

Septic Fields

On-site wastewater systems can result in a variety of problems, both on-site, and across a wide geographical area. Soil absorption systems can fail, resulting in contaminated ground and surface water, and is the third most common source of water contamination (Marsh 343). Failure is usually the result of improper siting or design for the site, overloading of the system, inadequate maintenance, and loss of soil percolation capacity (such as due to increased moisture in the soil) (Marsh 114). Unusually wet years are especially prone to system failure, where soil percolation is reduced and contaminants can be carried further distances. Soil, over time, also builds up water and chemicals, and after 15-20 years septic fields should be abandoned and rebuilt on a new location. Reduction in permeability due to increased moisture can lead to septic overflow and backup, resulting in sewage on the surface of a residential lawn. Additionally, slopes increase percolation where the sewage flows too quickly to provide adequate filtration (Marsh 116).

Ground water contamination is a unique problem in that it is ‘out of sight, out of mind’ in comparison to surface water contamination (Randolf 2004, 487). Ground water quality and contamination is difficult to monitor, and more difficult to treat than surface water. Underground water systems can be extensive with the contamination source being a great distance from the first detection of contamination. It is particularly dangerous because residences using ground water for domestic use through private wells mostly do so without additional treatment or quality monitoring (Randolf 2004, 487).

Water contamination from failed on-site wastewater systems can result in serious public health risks. Health effects can be both acute and chronic. Acute health effects are the result of exposure to pathogens and chemicals such as nitrates. Pathogens, such as coliform bacteria, can cause gastrointestinal illness and death, as was seen in Walkerton, Ontario. Chronic health effects can include birth defects, cancer, and disorders of the nervous system from exposure to lead, metals, and volatile organic chemicals such as pesticides, solvents, and other petrochemicals. These contaminants also originate from leaking underground tanks, landfills, lagoons, and surface runoff (Randolf 2004, 487).

Outcomes

Currently there are plans for waste water management via piped services being prepared for certain areas of the Selkirk and District Planning Area. It is anticipated that this first phase of waste water infrastructure will be in place within the next 2 to 5 years. The extension and construction of such waste water infrastructure is subject to inter-municipal agreements, local improvement areas and development agreements. As a Settlement Centre, the Middlechurch area within the RM of West St. Paul has plans for extended sewer infrastructure which may be accomplished through intermunicipal agreements and shared services between the City of Winnipeg or the RM of St. Andrews. There is also the option of stand alone plants. Given the above information on health orders and septic field failures there are also plans for the extension of waste water treatment from the RM of East St. Paul to the southern portion of the RM of St. Clements and the installation of piped services in the East Selkirk area which has also been identified as a Settlement Centre. The Grand Marais Settlement Centre is also anticipated to have extended waste water infrastructure in developed areas. Discussions between the City of Selkirk and the RM of St. Andrews point to the extension of municipal services from the City of Selkirk to the Lockport Area.

Development Plan

The Selkirk and District Planning Area is using its draft development plan to address issues of

sewage treatment, development patterns, and the environmental and human damage done by septic fields and improper drainage. The draft development plan is using a sustainability approach and is directing new development to piped areas. This is being done through densification which makes use of existing sewage infrastructure, and directing development to existing areas designated Settlement Centre or General Neighbourhood Development Area.

The Planning Area Board promotes the densification of residential development in the City of Selkirk, Settlement Centres, and General Development Areas in the Planning Area. Densification makes the provision of sewer and water services increasingly fiscally feasible which would in turn reduce the negative environmental and potential health impacts of septic fields. Secondary plans are being prepared to ensure future sustainability of development as well as the phasing of orderly development in the Red River Corridor.

Lessons learned

Rural residential development and subdivision development made without consideration of long term sewage treatment, soil drainage, and environmental impact has high financial, environmental and human costs. The large amounts of flat, river side land is attractive for development for home owners and municipalities looking for larger income from property tax. Scenic views and short term financial gain has been shown to be overshadowed by failed septic fields, contaminated rivers and wells. Communities in the Red River Corridor have been issued boil water advisories due water contamination. Yellow snow seen in area ditches in spring is a visual reminder of these costs.

The area has responded to these issues with the formation of the Red River Infrastructure Committee and the new Development Plan. Intermunicipal cooperation will allow this area to transition to piped services from the current inadequate septic field system. This has also contributed to the ability of the organization to receive funding for new infrastructure.

The Development Plan uses a sustainability approach and the treatment of sewage is a major factor in the direction of new development. In anticipation of future population growth, to mitigate environmental and health risks, and to reduce service costs, the development plan directs development to infill, densification, and neighbourhood and settlement areas. All new development must be hooked up to piped services, and older developments are planned to be transitioned to piped services.

Sewage, sewage infrastructure, and sewage treatment are major components of the workings of a municipality. These initiatives have placed the emphasis on this every day issue, focusing decisions about development on how we deal with our waste. In this area, sewage will shape the growth of neighbourhoods. The understanding of sewage, sewage infrastructure and sewage treatment has shaped the Selkirk Development plan, and will lead to improvements in environmental and human health, conservation of farmland, and the fiscal viability of the municipality.

Other municipalities in Manitoba could benefit from this approach to regional planning. Converting subdivisions to piped services and reducing the number of new lots with septic fields will benefit municipalities financially in the long term, and reduce environmental impacts.

Next Steps

As the Development Plan is moving towards finalization and adoption, Selkirk and area is moving forward on many fronts to implement these plans. Currently they are working on secondary plan preparation and adoption, for a more detailed plan of densification and infrastructure development. The five municipalities are also working on inter-municipal agreements, senior government support, and Municipal Board approvals. The municipalities are working on more detailed engineering and costing reports on converting homes from septic fields to an extended piped service. In conjunction with this, they are also working on individual property owner financing options.

As the municipalities along the Red River Corridor are taking these next steps, it is

acknowledged that the process of rehabilitation and reconfiguration of development patterns will take considerable time, effort and resources to complete. These municipalities have taken these first important steps, displaying cutting edge regional planning.

References

- Marsh, William. M. (2005). 4th Edition. "Landscape Planning: Environmental Applications" John Wiley and Sons.
- Poirier, R. (2007). RRIC Presentation to Public Forums. Available online. Accessed Dec. 3, 2008 from http://www.rric.ca/presentations/Presentation_B_Poirier.pdf
- Randolph, John (2004) "Environmental Land Use Planning and Management" Island Press
- Selkirk and District Planning Area Board (2009) Selkirk and District Development Plan. Available online. Accessed April 14, from http://www.selplan.net/index2.php?option=com_docman&task=doc_view&gid=144&Itemid=35
- Walker, Stephen (2007) Background Study Report: 5 Year Development Review. Selkirk and District Planning Area Board. Available online. Accessed April 3, from http://www.selplan.net/index2.php?option=com_docman&task=doc_view&gid=112&Itemid=35