

History of Landfilling in Red Deer

Background

Prior to 1972, The City of Red Deer operated a number of smaller landfills throughout the city. In 1972, the former landfill where the oxbows dog park is currently located began operation. In 2001, The City of Red Deer's current Waste Management Facility began operating.

In the early part of the twentieth century, it was common that waste would be collected at "nuisance grounds" and the combustible components burned prior to disposal. In the 1960s, sanitary landfilling became the norm, where waste was not burned and was instead compacted using a bulldozer and covered with a layer of soil at the end of each day. Historically, waste was often viewed as a cheap and available material to fill in low areas, so it's not uncommon to find former gravel pits or other low lying areas converted to landfills. In many cases the city has grown and developed around these former landfill sites. Our understanding of the potential impacts former landfills can have on the environment and adjacent properties has also evolved significantly over time.

The City of Red Deer completed a project in 2015 to investigate the historic landfill sites that The City had operated. Due to the age of the landfill sites, in many cases very little information was available about past practices at the site. The goal of the project was to increase our level of understanding of the various sites, in order to be better able to make sound and timely decisions related to the former landfill sites.

The project consisted of three stages:

- Phase I Environmental Site Assessment – compilation and review of available information pertaining to each site
- Phase II Environmental Site Assessment – physical investigation of the landfill sites to determine the boundaries of waste disposal and the quality of soil gas and groundwater
- Environmental Risk Management Plan – develop a site specific risk management plan and for future development, scientifically determine appropriate setback distances from each landfill site.

Findings:

A number of recommendations were developed through the project. The Convent Hill landfill site was suspected to have been used as fill during the construction of a portion of Gaetz Avenue. The Phase II investigation encountered no waste, so it was concluded this site is not a landfill.

For the remaining eight landfill sites, it was recommended to conduct another round of groundwater and soil gas sampling, either biannually or quarterly depending on the site, so that seasonal variations could be identified. This additional monitoring will also assist in determining if there are any environmental concerns that require further action. A Request for Proposal will be issued to hire a consulting firm to conduct this work.

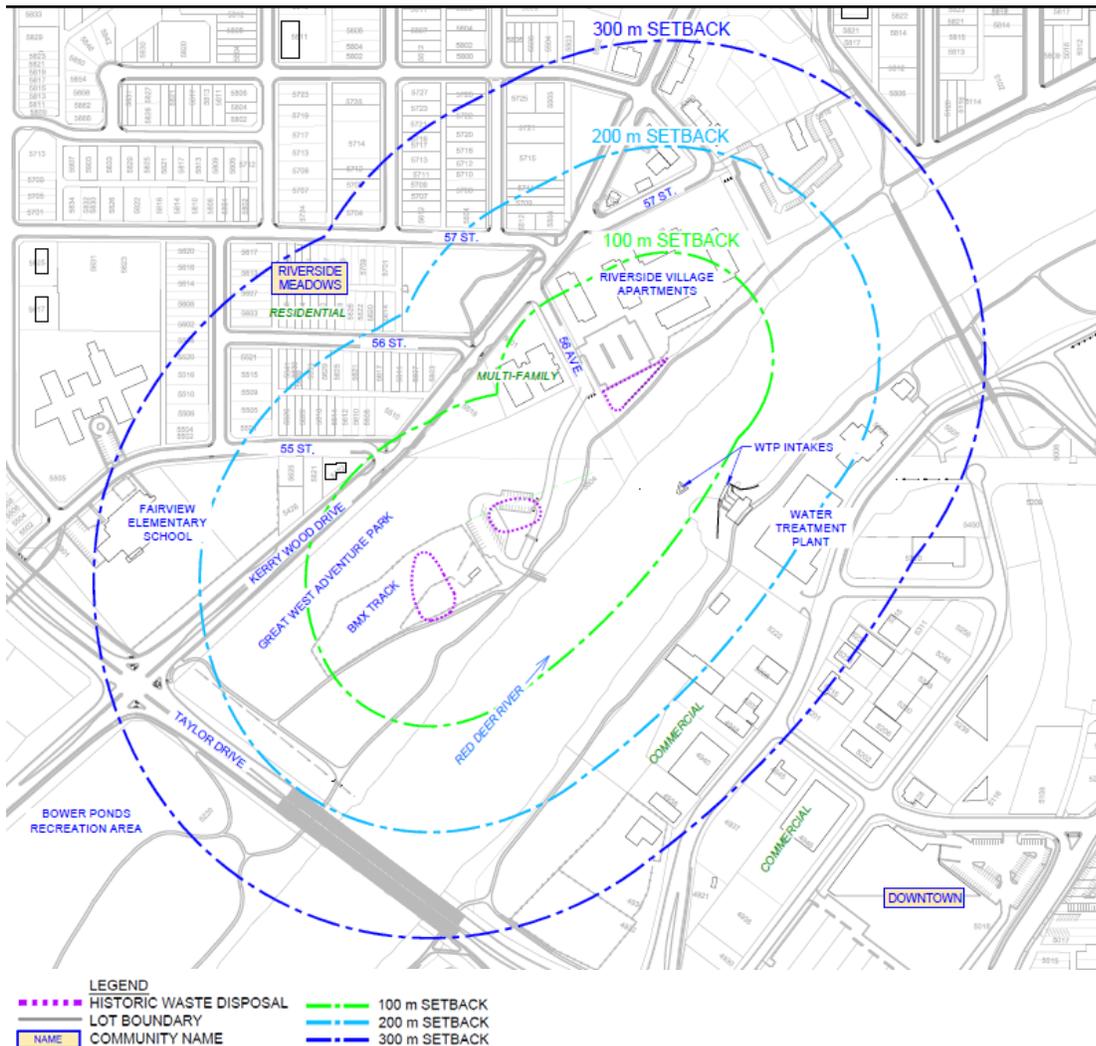
It was also recommended that the Environmental Risk Management Plans (ERMP) be updated with the results from the next planned testing, any future testing events, and also as a minimum every 5 years to keep up with future changes in standards and codes.

The following table summarizes the former landfills operated by The City of Red Deer.

Disposal Site	Operator	Operation Dates	Primary Type of Waste Landfilled
Great West Adventure Park	Village of North Red Deer	1923 - 1947	Municipal Solid Waste
Montfort	City of Red Deer	1968	Municipal Solid Waste
Mackenzie Trails	City of Red Deer	1930 - 1964	Municipal Solid Waste
Lindsay Thurber Comprehensive High School	City of Red Deer	1965 - 1967	Municipal Solid Waste
Red Deer College	City of Red Deer	1970 - 1972	Municipal Solid Waste
Red Deer Motors	City of Red Deer	1967 - 1968	Municipal Solid Waste
Riverside Light Industrial Park	City of Red Deer	1961 - late 1970s	Construction Debris
Riverside Heavy Industrial Park Dry Waste	City of Red Deer	1994 - 2007	Construction Debris
Convent Hill (Gaetz Ave Hill)	No waste was found during Phase II investigation, site determined not to be a landfill.		

Great West Adventure Park Landfill Site:

The Village of North Red Deer operated a landfill at the current location of the Great West Adventure Park from approximately 1923-1947.

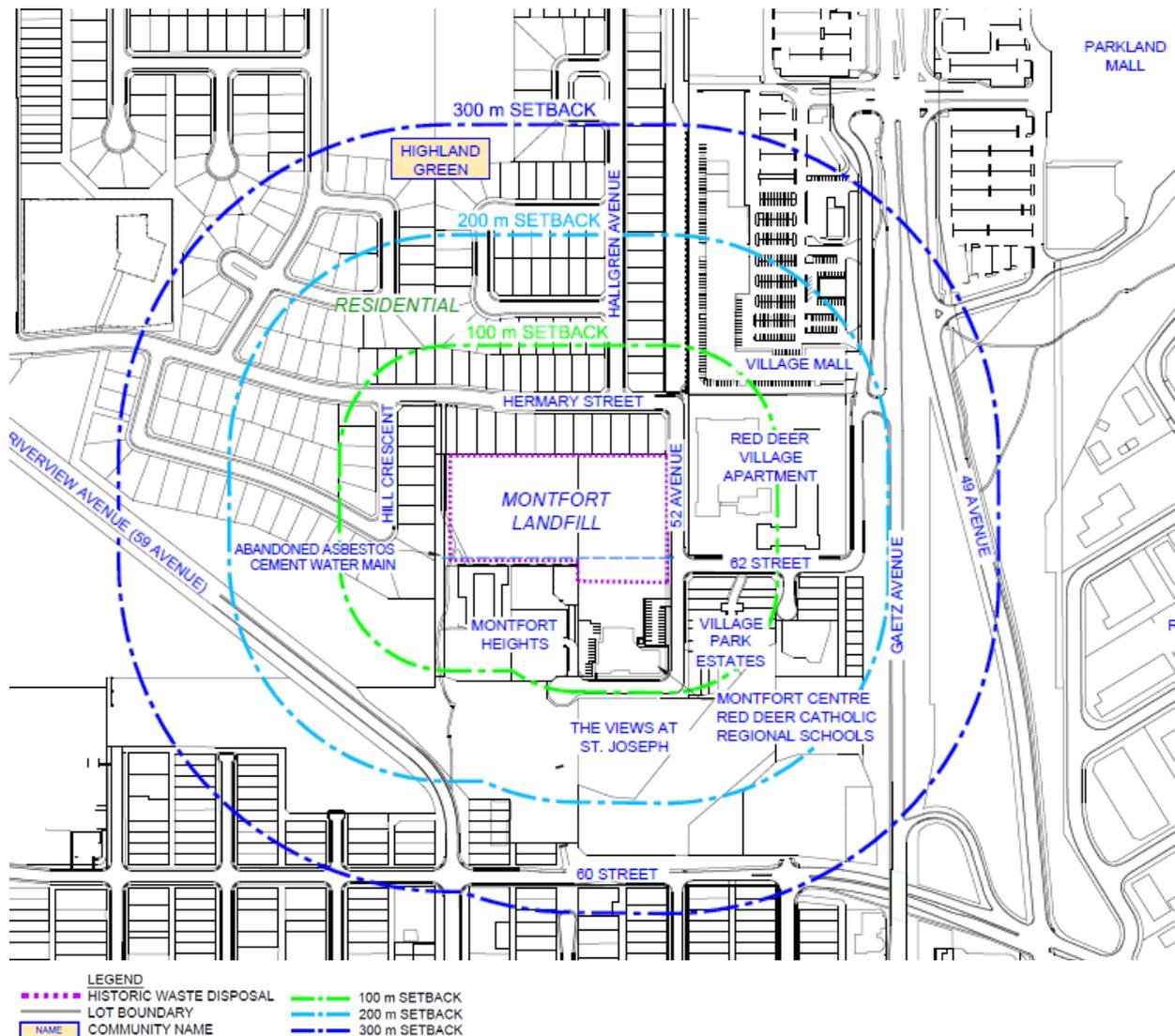


Outcome

- The waste footprint was different than originally estimated. Three separate waste disposal locations were identified.
- Both soil vapour and groundwater showed landfill related impacts, but not at concentrations considered an environmental risk.
- Further investigation was recommended around the northernmost waste disposal area, as the initial investigation did not include investigations on private property.
- Future development outside the 100m setback would not be required to have mitigative measures, to be supported by The City.

Montfort Landfill Site

The Montfort Landfill site was operated during 1968-1969 under permit M131 issued under the Public Health Act. The area of the disposal site was a slough area owned by the Separate School Division, and the landfilling was conducted with their permission and with the intent to “reclaim” the area for useful purpose.



Outcome

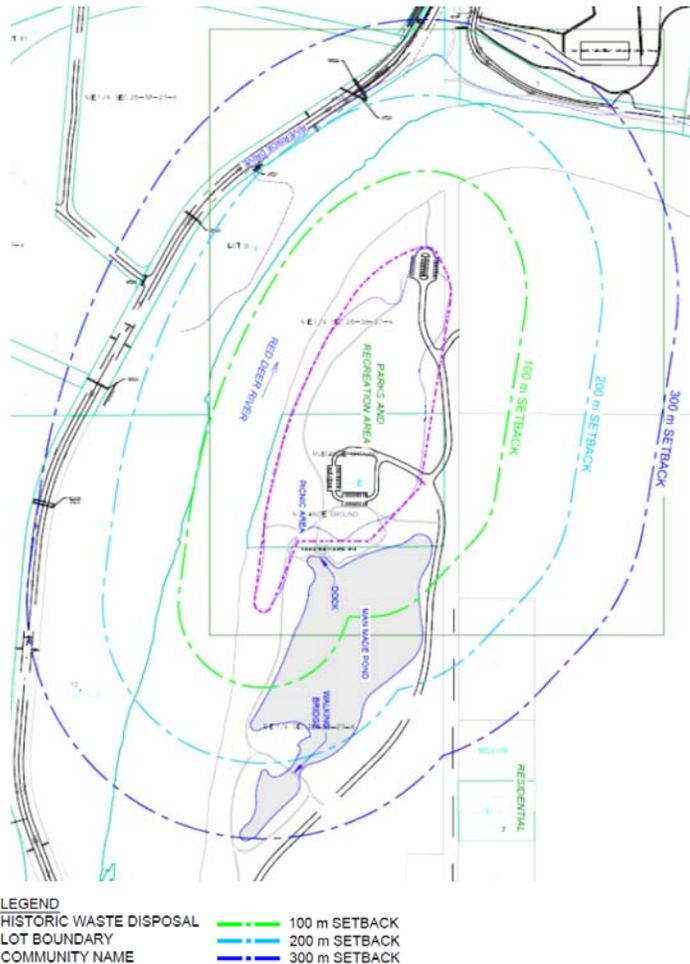
- The waste footprint was slightly larger than previously estimated, extending further to the west and slightly further to the south on the east portion of the disposal area.
- The north limit of waste is interpreted to be at the residential property boundary.
- There is evidence of landfill impacts in both the groundwater and soil vapour.
- Due to the proximity of residential homes to the waste, a unique recommendation in the Montfort Phase II ESA is to conduct indoor air quality sampling in two or three homes, testing for VOCs. The results of initial sampling would be used to determine if testing at additional

homes is recommended. This task has been included in the scope of work for the RFP covering the additional monitoring recommendations.

- Future development within the 300m setback would be required to have mitigative measures, to be supported by The City. The level of mitigative measure required generally decreases with increased distance from the landfill site.

McKenzie Trails Landfill Site:

Records are unclear when The City commenced landfilling at this site some records indicate the 1930s and others the 1940s. Landfilling continued until June 1965 when this site was shut down and the Lindsay Thurber site opened.



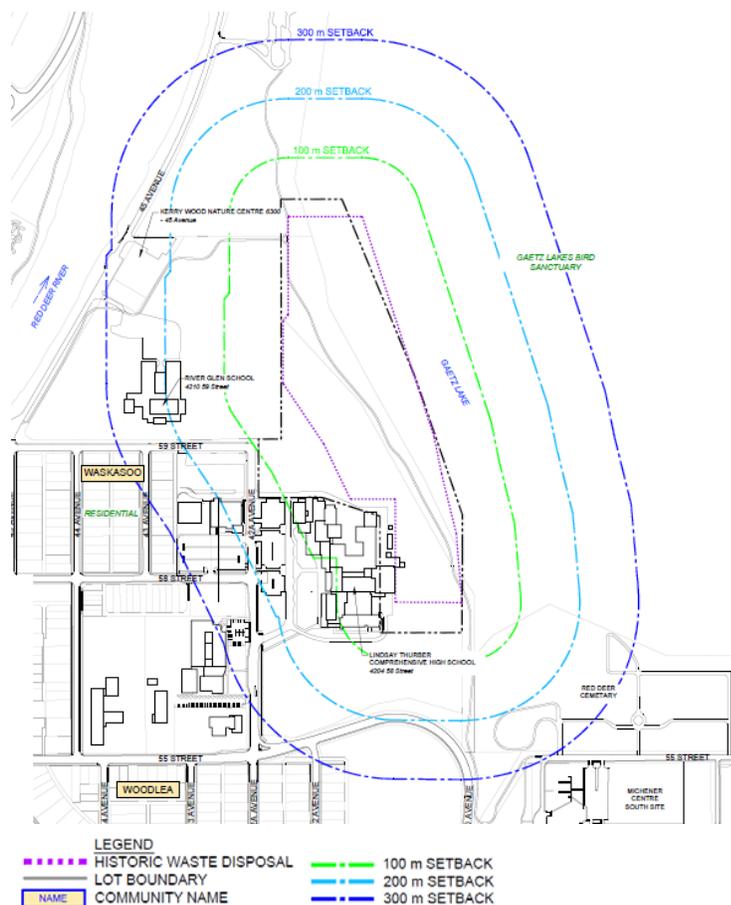
Outcome

- The waste footprint was slightly larger than previously estimated, extending further to the north and slightly further to the south.
- Both soil vapour and groundwater showed landfill related impacts. The concentrations within the soil vapour are not expected to pose an environmental concern. The concentrations within the groundwater indicate the leachate is impacting the groundwater and potentially the river quality.
- The lack of many residential or commercial properties within 300m of this site means that the primary potential risk is to the environment, not to people's health and safety. Future development is not expected to occur, due to reasons other than the former landfill site (e.g. zoning, proximity to river).

Lindsay Thurber Landfill Site:

The Lindsay Thurber Comprehensive High School Landfill site was operated from 1965-1967 under permit M77 issued under the Public Health Act. The Public School Board approached The City, identifying the location for landfiling, following public attention relating to the need for a new city landfill and the high level of opposition from residents of Fairview adjacent to The City's proposed new landfill location. The location of the landfill site was land owned by the Public School Board Division between the high school site and Gaetz lakes.

A landfill gas cut off trench was installed between the waste disposal area and Lindsay Thurber in the mid-2000s as part of the school's expansion to mitigate the potential risk of landfill gas migration towards the school buildings.



Outcome

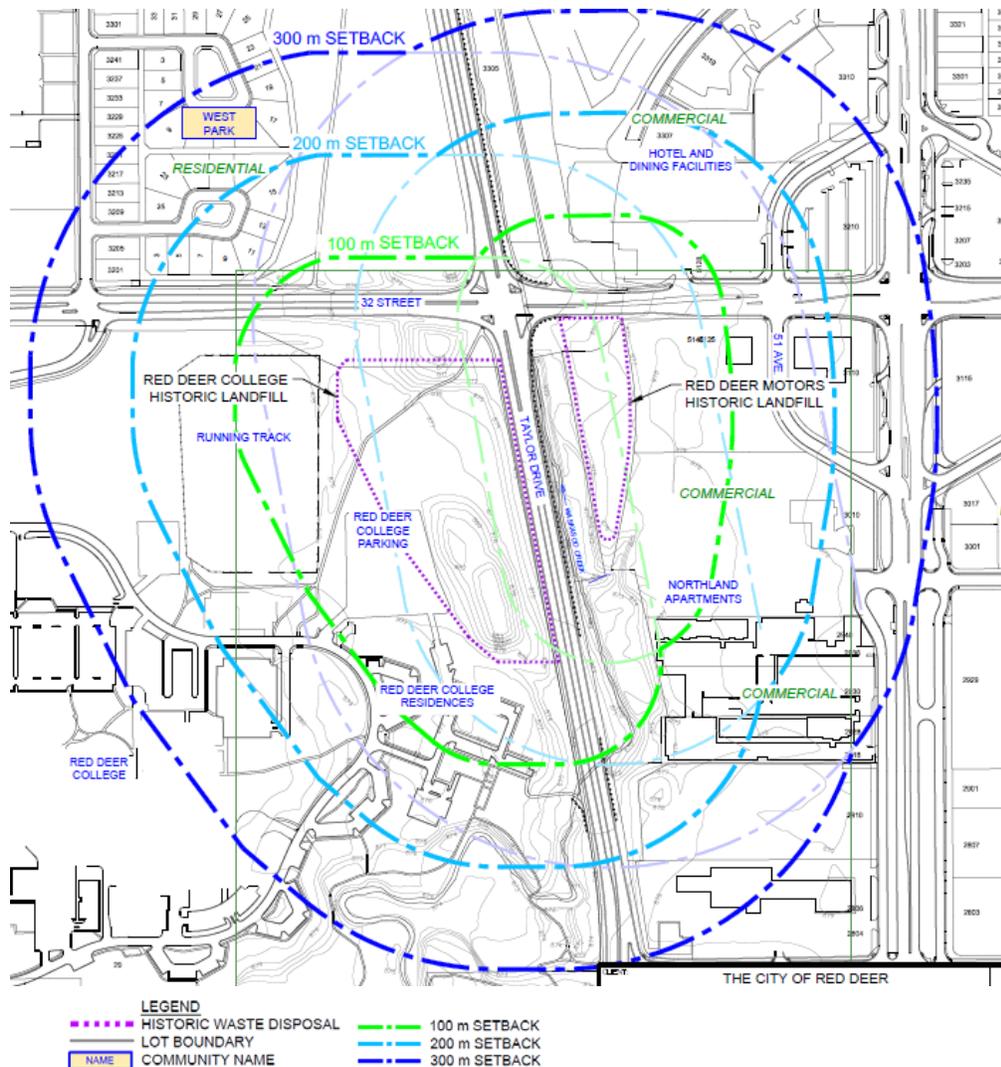
- The waste footprint is larger than previously estimated, extending farther north and the waste disposal area waste continuous, not in separated locations.
- Both soil vapour and groundwater showed landfill related impacts.
- Future development outside the 100m setback would not be required to have mitigative measures, to be supported by The City.

Red Deer College and Red Deer Motors Landfill Sites:

Due to the proximity of these two sites and the similar timeframe of landfilling, both sites were dealt with in one ERMP.

The site formerly known as the Red Deer Motors landfill is referred to in this way as it was a former landmark near the site. The name Red Deer Motors landfill in no way indicates that Red Deer Motors was responsible for landfilling on the site.

The Red Deer Motors site was operated from 1967-1968 and the Red Deer College landfill site was operated from 1970-1972.

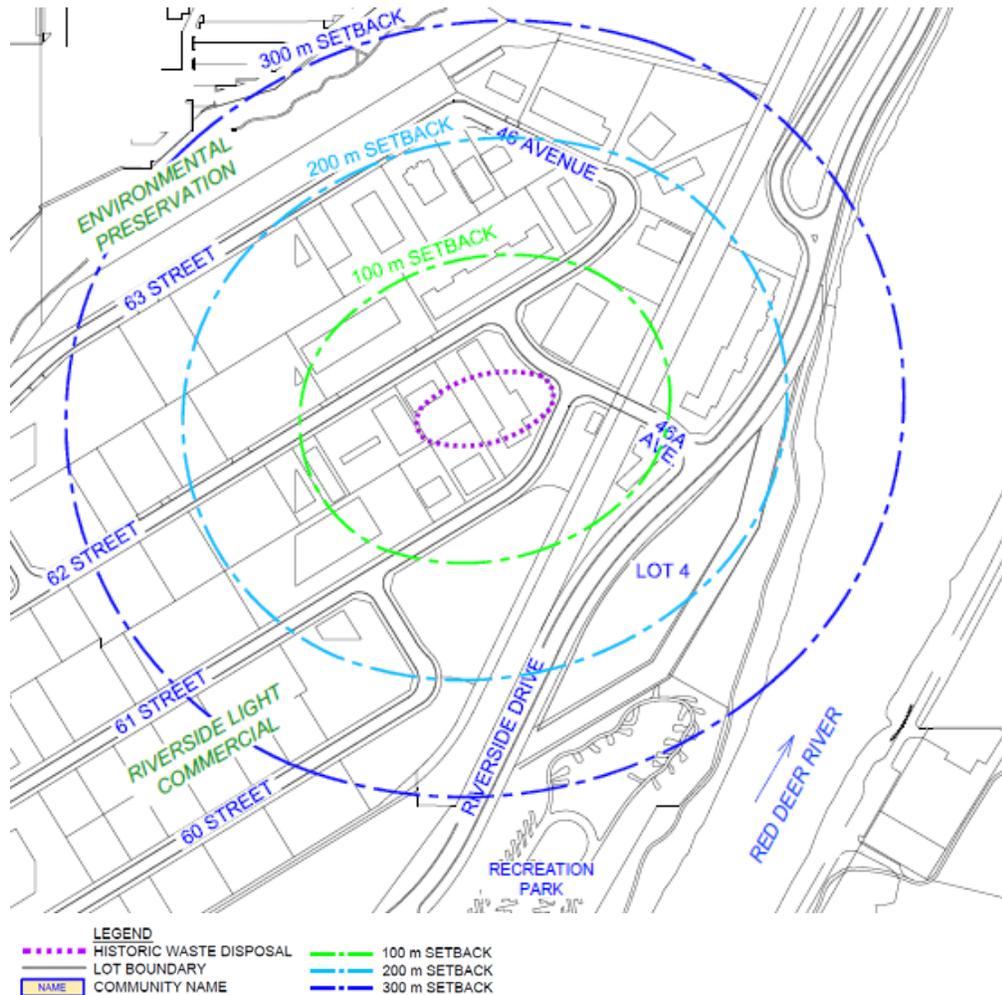


Outcome

- The waste footprint of the Red Deer Motors site was determined to be very similar to what was previously estimated. The waste footprint for the Red Deer College site is larger than previously estimated, extending farther west at the north end of the disposal area.
- Both soil vapour and groundwater showed landfill related impacts, concentrations within the groundwater indicate the leachate is impacting the groundwater and potentially the creek quality. Hydrocarbon contaminated soil was encountered at the Red Deer Motors site.
- Future development within the 300m setback would be required to have mitigative measures, to be supported by The City. The level of mitigative measure required generally decreases with increased distance from the landfill site.

Riverside Light Industrial Park Landfill:

Records indicate waste disposal occurred between 1960 and the late 1970s, and the waste was suspected to be primarily construction debris. The site was never licensed as a landfill, so there were not many records relating to this site.

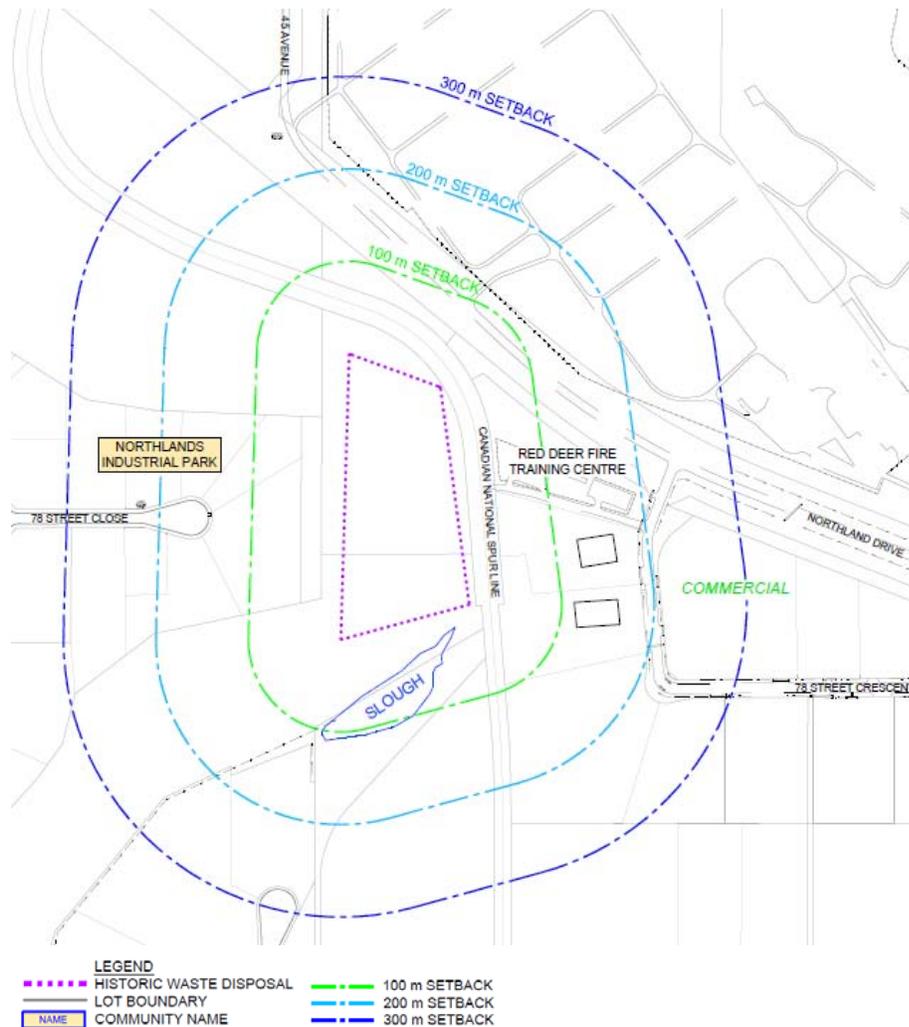


Outcome

- The waste footprint is smaller and located more southeast than previously estimated.
- Both soil vapour and groundwater showed landfill related impacts.
- Future development outside the 100m setback would not be required to have mitigative measures, to be supported by The City.

Riverside Heavy Industrial Park Dry Waste Site:

This site was operated as a slope stabilization project from approximately 1991-2007, where concrete, asphalt and soil were disposed of to stabilize the slope.



Outcome

- The waste footprint was determined to align with previous estimates. Some municipal solid waste was found in the upper central portion of the slope.
- Both soil vapour and groundwater showed mild landfill related impacts.
- Future development outside the 100m setback would not be required to have mitigative measures, to be supported by The City.

Other Landfills within City limits

The City's currently operating Waste Management Facility (WMF) is located in the south of the city, at 1709 40 Ave and has been in operation since 2001. Between 1972 and the opening of the WMF, The City's landfill was located immediately west of the WMF. The northern half of this closed landfill site was redeveloped as the Oxbows off-leash dog park in 2010. Environmental monitoring of groundwater, surface water and soil gas are conducted annually for both the WMF and the adjacent closed landfill site. Annual monitoring requirements and other aspects of the WMF's operations and the closed landfill's post-closure care are outlined in approval number 154918-01-00, issued under the Environmental Protection and Enhancement Act.

There are three other landfills within city limits, which were not operated by The City of Red Deer, so were not investigated to the level detail the City operated landfills were. These three landfill sites are located in the area annexed from Red Deer County in 2009, north of Highway 11A. One of the landfill sites was operated by Red Deer County from approximately 1959-1965. As the holder of the permit to operate this landfill, Red Deer County retains responsibility for landfilling activities. The other two sites were privately owned and operated and both landowners were directed to cease inappropriate landfilling on their properties as they had not obtained the necessary permits to operate a landfill.