# The Town of Fort Frances

# Improvements to the Town's Recyclable Material Transfer Station

## Continuous Improvement Fund Project Report

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## Executive Summary

Communities in the northern region of Ontario are confronted with unique waste management issues such as small populations and long distances to recyclable material processing facilities and markets. These issues present operational and economic challenges for the management of recycling programs. The Continuous Improvement Fund (CIF), at the request of the Town of Fort Frances, conducted a review of operations to increase the effectiveness of their new recyclable material transfer station.

Based on the tonnage of recyclable material and the current cost to transport recyclable material for processing, the following options would help increase the effectiveness of the new operation:

- Construct a properly engineered loading ramp that has a minimum loading height of 2 metres; and
- Implement a recycling depot at the transfer station to allow residents to drop off recyclable material.
- Expand the existing recyclable material storage building to provide the indoor unloading and loading of material;

These new initiatives will increase the efficiency to manage recyclable material during inclement weather, manage material from other local area programs and lower program costs, maximize the capacity of material transported to the MRF, and increase the diversion of recyclable material. Implementation of the initiatives will result in operating savings of approximately $8,000.00 annually. The capital cost to implement the recommended improvements to the current operation is approximately $159,500.00.

Furthermore, the Town should explore a business case to become a hub for the transfer of recyclable material from other local recycling programs. The cost for northern Ontario programs to transport recyclable material to Material Recycling Facilities prohibits the ability for some areas to provide a recycling program. Depending on the amount of available material in the surrounding area and the level of user fees the Town could charge to provide this service, this initiative could result in additional funds to offset capital costs to improve the Town's system and provide future revenue.

## 1. Background

The Town of Fort Frances is located in Northeastern Ontario and has a population of approximately 8,103. The Town currently provides a curbside blue box collection program. The program operates every second week collecting approximately 380 tonnes/year. The blue box collection contractor delivers the recyclable material to the Town's new transfer station. The transfer facility is operated by Town staff. The Town stockpiles loose recyclable material inside a metal clad building consisting of a concrete floor and overhead door where curbside vehicles back into the building to unload their material. A temporary ramp has been constructed near the front of the facility to accommodate the loading of material into open top walking floor transport trailers using a front end loader.

Recyclable material is transferred from Fort Frances to a Materials Recovery Facility (MRF) in Winnipeg. The Town has an agreement with Gardwine North Limited for the haulage of recyclable material to the Winnipeg facility. Gardwine currently hauls woodchips from Winnipeg to a pulp and paper mill in the Fort Frances area and backhauls the Town's recyclable material to the Winnipeg MRF.

The CIF is conducting a review of the new transfer station to examine options that will increase the effective operation of the facility including:

- Equipment required to increase efficiencies; and
- Facility layout

The new facility has the potential to improve the efficiency of the Town's recycling program and act as a transfer centre that could be utilized by other area recycling programs.

## 2. Current Operation

The Town of Fort Frances reported recycling of approximately 380 tonnes of material in 2007. It is estimated that the Town will collect and transfer approximately 450 tonnes of recyclable material in 2008. The Town does not process the recyclable material it collects. Single stream recyclable materials are bulked and transferred to a MRF in Winnipeg. Recyclable material collected by the Town include ONP, boxboard, OCC, fine paper, and gable top, aseptic, steel, aluminum and rigid plastic containers.

The Town has recently developed a new transfer station located at the public works yard to store and transfer recyclable material to the MRF. The transfer station consists of a metal clad Butler style building with a concrete floor and overhead door at the entrance. The building is approximately 192 $m^2$ and will accommodate approximately 1 month storage of recyclable material. A temporary ramp constructed of recycled asphalt product is located outside the entrance of the building to accommodate the loading of recyclable

material into top loading transfer trailers. Town staff manages and operate the facility and load the recyclable material into transfer trailers using a CAT IT38G front end loader. The operation to load the transfer trucks takes approximately 1 hour of 1 staff person's time per week. The front end loader is not dedicated to the work at the transfer station. The transfer station is located adjacent to the public works yard. Access to a front end loader is not an issue as one of three Town loaders is almost always available.

Figure 1: Fort Frances Transfer Station

The Town has a non-contractual agreement with Gardwine North Limited, a transportation and haulage company that transports their recyclable material from Fort Frances to the Winnipeg MRF in top loading walking floor transfer trailers. Gardwine currently delivers material from Winnipeg to a pulp and paper mill in Fort Frances. When the Town has enough recyclable material to fill a transfer trailer, they contact Gardwine North who back-hauls the material to Winnipeg. The cost to haul the recyclable material to Winnipeg is approximately $1,000.00 per load. In 2007 the Town managed approximately 373 tonnes of recyclable material and the cost to transfer the material was approximately $36,000.00. This amount equates to approximately $97.00/tonne for the transfer of the Town's recyclable material.

Glass is not collected through the curbside collection program. The Town provides a bin that is located at the public works yard for residents to drop off glass. Glass is currently stockpiled at the Town's public works yard as there are currently few cost effective markets for this material.

# 3. Improvement Options

A number of options were considered that could improve the effectiveness of the Town's new transfer station. Options were evaluated based on their capacity for reduction in staff and/or ability to increase efficiencies in the transport of material to the MRF. Three methods were chosen for discussion including methods to reduce staff time required to manage the transfer station and requirements for storage of recyclable material and increase transportation efficiency. The capital and operating costs for each option were compared and evaluated for their ability to increase efficiencies and reduce cost.

Furthermore, the Town wishes to include a public drop off area for recycling. Currently the Town's recycling contractor provides the only recycling depot for Fort Frances residents. The contractor retains these materials for processing at a private MRF. The Town cannot claim the material captured through the contractors recycling depot as part of their WDO data call and therefore it becomes lost revenue to the Town.

## 3.1 Transtor Transfer Station

To increase the efficiency of the Town's transfer station, mechanisms to reduce staff time and handling of recyclable material were examined. The Transtor system was examined as it is a fully integrated storage and power loading device and has been successfully implemented in Dryden as well as other municipalities and private sector facilities in Ontario. Implementation of the Transtor system at the Fort Frances public works yard would involve the construction of a ramp and retaining wall to allow the curbside recycling vehicles to empty recyclable material into the unit. Hydro would also need to be supplied to the unit to operate its hydraulic tipping system. Recyclable material is stored inside the unit which is enclosed making it animal and weather proof. When a sufficient amount of material has been collected for transfer to the MRF, the unit "self tips" the material into a transport trailer. This device would eliminate the need for the Town's storage facility and minimize operational time normally required by staff to load a transfer trailer using a front end loader.

Figure 2: Transtor Unit

Figure 3: Recycling Truck Ready to Unload into Transtor Unit


The Transtor units are available in 31 $m^3$ and 40 $m^3$ capacities. The Town would require the installation of 2 Transtor units to accommodate peak periods of recyclable material. Since the units are modular the system is easily expanded. For example more units could be added if Fort Frances was to become a centre for the delivery of recyclable material from other recycling programs in the surrounding area. The Transtor units have a lifecycle of 15 to 20 years at which time the units would need to be replaced. The capital cost to implement a Transtor Transfer Station at the Town's public works yard would cost approximately $375,000.00. The Town shipped approximately 38 transfer trailer loads of material in 2007. Based on projected tonnages for 2008 approximately 45 transfer trailer loads of recyclable material will be shipped to the MRF this year. The implementation of a Transtor transfer system would minimize staff time required to operate the facility. This would result in an annual savings of approximately $2,600.00

based on the current time required by Town staff to load a transfer trailer using a front end loader.

Table 1: Approximate Capital Cost to Implement Transtor and Operating Cost of Current System

| **Transtor Transfer System** | **Capital Cost** | | **Existing System** (loading transfer trailers using a front end loader) | **Annual Operating Cost** |
|---|---|---|---|---|
| Transtor unit (2) | $200,000.00 | | Operator | $750 |
| Retaining wall | $50,000.00 | | Loader | $1,850.00 |
| Ramp & Site Work | $100,000.00 | | | |
| Hydro | $25,000.00 | | | |
| | | | | |
| Total | $375,000.00 | | Cost saving | $2,600.00 |

## 3.2 Compaction Trailer

Town staff has constructed a temporary ramp to accommodate loading recyclable material into non-compaction top loading 90$m^3$ transfer trailers using a front end loader. The average weight per load from January to September 2008 is 9.8 tonnes. Standard compaction for this type of operation should yield a load average of 12 tonnes. The reason for the current low weight is due to the height of the temporary ramp at the Town's transfer station. The current loading ramp is approximately 1.5 metres high and does not allow sufficient clearance for the front end loader to compact material into the transfer trailer using its hydraulic bucket.

Utilization of a compaction transfer trailer would allow greater capacity and require less loads of recyclable material to be shipped to the MRF. Compaction trailers average 18 tonnes per load for mixed recyclable waste. Therefore, a compaction trailer would increase the efficiency of transporting material by approximately 80%. Assuming that the Town would purchase a compaction trailer and contract the haulage, this type of operation would require a round trip and therefore, a higher cost per load then the Town is currently paying.

Table 2: Cost of Haulage Using a Compaction Trailer vs. Current System

| Trailer | Capital Cost | Tonnes/Year | Tonnes/Load | # Loads/Year | Haulage Cost/Load | Total Cost |
|---|---|---|---|---|---|---|
| Compaction | $40,000.00 | 450 | 18 | 25 | $1,500** | $37,500 |
| Non Compacting | $0 | 450 | 12* | 37.5 | $1,000 | $37,500 |

*Assuming loading ramp is constructed at proper height.

**A conservative price of $1,500 applied to per round trip of approximately 850 kilometres.

While a compaction trailer would decrease the number of loads transferred to the MRF, the increased cost per load to haul the material negates any savings in transportation efficiency and requires a $40,000.00 capital investment. However, the City of Dryden owns a compaction trailer that could also be utilized by the Town of Fort Frances. Considering the distance between the 2 communities (approximately 190 kilometres) and the Town's current haulage cost, it would not be economically feasible to partner with Dryden at this time for the use of its compaction trailer due to the additional cost that would be incurred for haulage. If the Town's recycling program expands to include the management of recyclable material from other local area programs, then Fort Frances should explore partnering with the City of Dryden to create further program efficiencies.

## 3.3 Optimize Current Operation

The Town's new transfer station is used to store recyclable material collected at the curb in a 195 $m^2$ Butler style building. A temporary loading ramp has been constructed near the entrance of the building to accommodate the loading of transfer trailers using one of the Town's front end loaders. Two significant operational changes are required, namely:

1. Construct a concrete loading ramp with an optimum loading height;
2. Extend the building to increase storage and load indoors; and
3. Obtain service agreements with surrounding municipalities, based on a user fee to manage their recyclable material.

Loading transfer trailers from within the building will improve loading conditions during inclement weather; minimize contamination due to rain and snow and decrease litter due to wind blown material. Construction of an addition to the existing building would require a capital cost of approximately $90,000.00. Another consideration for increasing the size of the new facility would include the ability to accept material from other local area programs.

Butler style buildings can be easily increased in size. Adding approximately 12m to the length of the building would allow for indoor unloading of curbside collection vehicles, storage of recyclable material and loading of the transfer trailers.

In order to increase compaction and load density, a properly engineered loading ramp should be constructed within the building to allow for safe loading of the transfer trailers at a height that would allow the front end loader to compact material in the transfer trailer using its hydraulic bucket. Compaction of the material by the front end loader would reduce the number of loads transferred to the MRF. Currently the Town is averaging less than 10 tonnes/load. Increasing the height of the loading ramp to a minimum of 2 metres will allow the loader to provide some compaction of material and increase loads to an average of 12 tonnes. Based on the Town collecting and transferring 450 tonnes of recyclable material in 2008, maximizing the volume of the transfer trailers could provide an annual savings of approximately $8,000.00.

If the Town decides not to increase the building size to manage the recyclable material indoors, then at a minimum it should replace the existing outdoor loading ramp with a properly engineered concrete ramp constructed at a height to allow effective loading of recyclable material.

Table 3: Transportation Savings

| | Tonnes/year | Tonnes/Load | Loads/Year | Cost @ $1,000/Load |
|---|---|---|---|---|
| Current 1.5 metre loading ramp | 450 | 10 | 45 | $45,000.00 |
| 2 metre loading ramp | 450 | 12 | 37 | $37,000.00 |
| **Savings** | | | | **$8,000.00** |

Table 4: Construction Cost

| Task | Cost |
|---|---|
| Reconstruct loading ramp | $60,000.00 |
| Expansion of existing storage facility | $90,000.00 |
| **Total Cost** | **$150,000.00** |

The payback period for the capital cost to optimize the Town's system is estimated to be 19 years based on the savings in operation costs. However, this option would provide the Town with the ability to manage additional recyclable material at its facility from the surrounding area. For example, the Town's cost to ship recyclable material to the MRF is approximately $85/tonne and if it were to charge $100/tonne to manage additional material, this charge would generate $15/tonne in revenue. Therefore, if Fort Frances were to manage an additional 400 tonnes of recyclable material annually and charge a user fee for the service of $100.00/tonne, this would generate additional revenue of approximately $40,000.00/year and decrease the payback period on the capital cost for construction to approximately 10 years.

Table 5: Payback on Capital Construction Costs

| | **Tonnes** | **Revenue** | **Haulage Cost** | **Net Revenue** | **Savings through Optimization** | **Payback Number of years** |
|---|---|---|---|---|---|---|
| **Current Town Program** | 450 | $0 | $37,000 | $(37,000) | $8,000 | 19 |
| **Import Material from other Recycling Programs** | 400 | $40,000 (based on importing 400 tonnes of recycling @ $100/tonne) | $33,600 | $6,400 | $14,400 | 10 |

## 3.4 Public Depot

Asselin Limited, the local contractor providing the Town's curbside collection service, provides the only depot in the area for residents to drop off recyclable materials. The Town wishes to incorporate a recycling depot at its new transfer station. The section of the transfer station property that fronts Sixth Street West is an ideal location to construct a depot. An access gate to the transfer station's yard presently exists on Sixth Street West. A fenced area with a secondary access gate to the transfer station could be constructed in this area to house the recyclable material collection containers. This would allow the Town to provide residents with access to the recycling depot but not the transfer station. See Appendix B for the conceptual site design. Sketch #1 in Appendix B illustrates an example of the recycling depot layout using the existing gate and entrance to the yard. Vehicles would enter the facility unload their material then complete a 3 point turn and exit using the entrance gate. Sketch #2 illustrates an example of a potential recycling depot layout with an additional vehicle exit to allow vehicles to drive straight through the facility without the need to back up. This layout would require the Town to construct a driveway and gate at the north-east corner of the yard. The drive-through option would be a preferable solution for the purpose of convenience to the public and safety.

The type of outdoor containers suitable for this application must be able to keep material dry and animal proof. Applicable containers would include a modified front end container similar to that which is being used by the Town to collect glass or a container that can be placed into a smaller area such as the Haul-All Hid-a-bag recycling containers that are sturdy and animal proof. A modified front end container can be transported using the Town's front end loader while the Haul-All container consists of a bag insert that would require Town staff to remove when full.

Figure 4: Haul-All and Front End Recycling Collection Containers


The cost to construct a fenced area for the depot and purchase recycling containers is approximately $9,500.00 not including the cost for any additional granular material that may be required to prepare the surface area.

Table 6: Cost to Construct Drop Off Depot

| Materials | Cost |
|---|---|
| Fencing including additional gate | $4,500.00 |
| Recycling Containers | $5,000.00 |
| **Total** | **$9,500.00** |

# 4. Recommendations and Conclusion

At this time the most effective option to improve the effectiveness of the Town's new recycling transfer facility would be to optimize the current system. The following optimization initiatives are ranked in order of priority:

1. Construct a new loading ramp;
2. Construct a public recycling depot onsite;
3. Promote the use of the transfer facility to other local municipalities to increase the amount of recyclable material throughput and charge a user fee for this service;
4. Enlarge current transfer building;
5. Consider haulage using a compaction trailer if the current haulage arrangement terminates.

Optimization of the current system will result in a more effective operation, increased efficiencies in transportation and a cost savings of approximately $8,000.00 annually. Implementation of initiatives 1, and 2 could be eligible for funding through the Continuous Improvement Fund. The Town should submit a project application if it intends to implement either of these options. The implementation of recommendation 4 would also be eligible for funding through CIF, especially if the operation of the facility includes other municipal blue box material utilizing the facility.

If Fort Frances decides that it does not wish to expand the existing storage facility for recyclable material at this time, then at a minimum the construction of a new ramp is recommended to improve safety of material loading and improved efficiency of material capacity for transport.

The Town should also consider developing a business case to explore potential quantities of recyclable material available from the local area, cost to manage and transfer material and revenues that could be attained. This initiative would help offset capital expenditures to optimize the Town's system and provide future revenue.

While the option to purchase a compaction trailer for the haulage of recyclable material would increase efficiency by maximizing the volume of material per trip and reducing the amount of trips to the MRF in Winnipeg, the Town's current agreement with their hauler provides significant cost savings and therefore, is the most cost effective haulage solution at this time. However, if the Town's haulage agreement with Gardwine North terminates

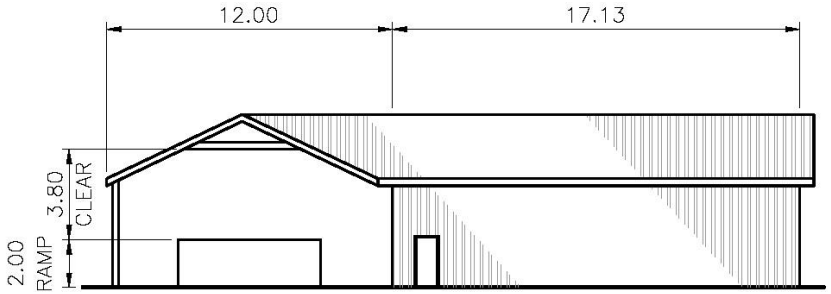
and/or Fort Frances becomes a transfer centre for other local area recycling programs then the Town should re-evaluate the following options:

1. Partner with the City of Dryden and share their compaction trailer;
2. Purchase a compaction trailer; and
3. Implementing a transfer system such as the Transtor if the Town does not wish to expand their current recyclable material storage building.

Furthermore, in light of the current decrease in fuel prices, the Town should attempt to renegotiate their haulage cost with Gardwine North. A new agreement that includes a fuel escalation clause will offer the hauler security if the price of fuel increases and therefore, could provide incentive for the contractor to decrease the Town's haulage cost.

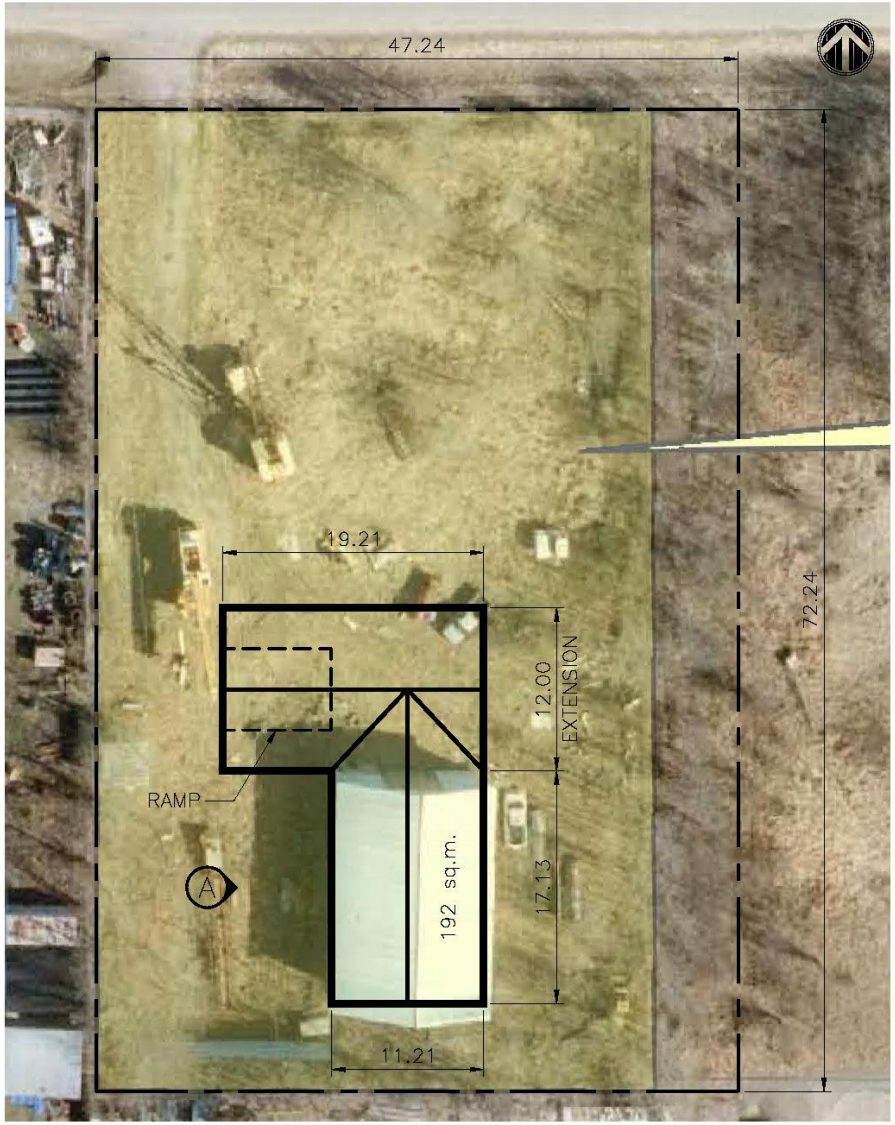
# Appendix A

## Town of Fort Frances Revised Transfer Station
## Conceptual Site Plan




## ELEVATION 'A'

N.T.S.





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PROJECT TITLE AND LOCATION:

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DRAWING TITLE:

SKETCH 1 – OPTION 1
PLAN & ELEVATION

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|---|---|
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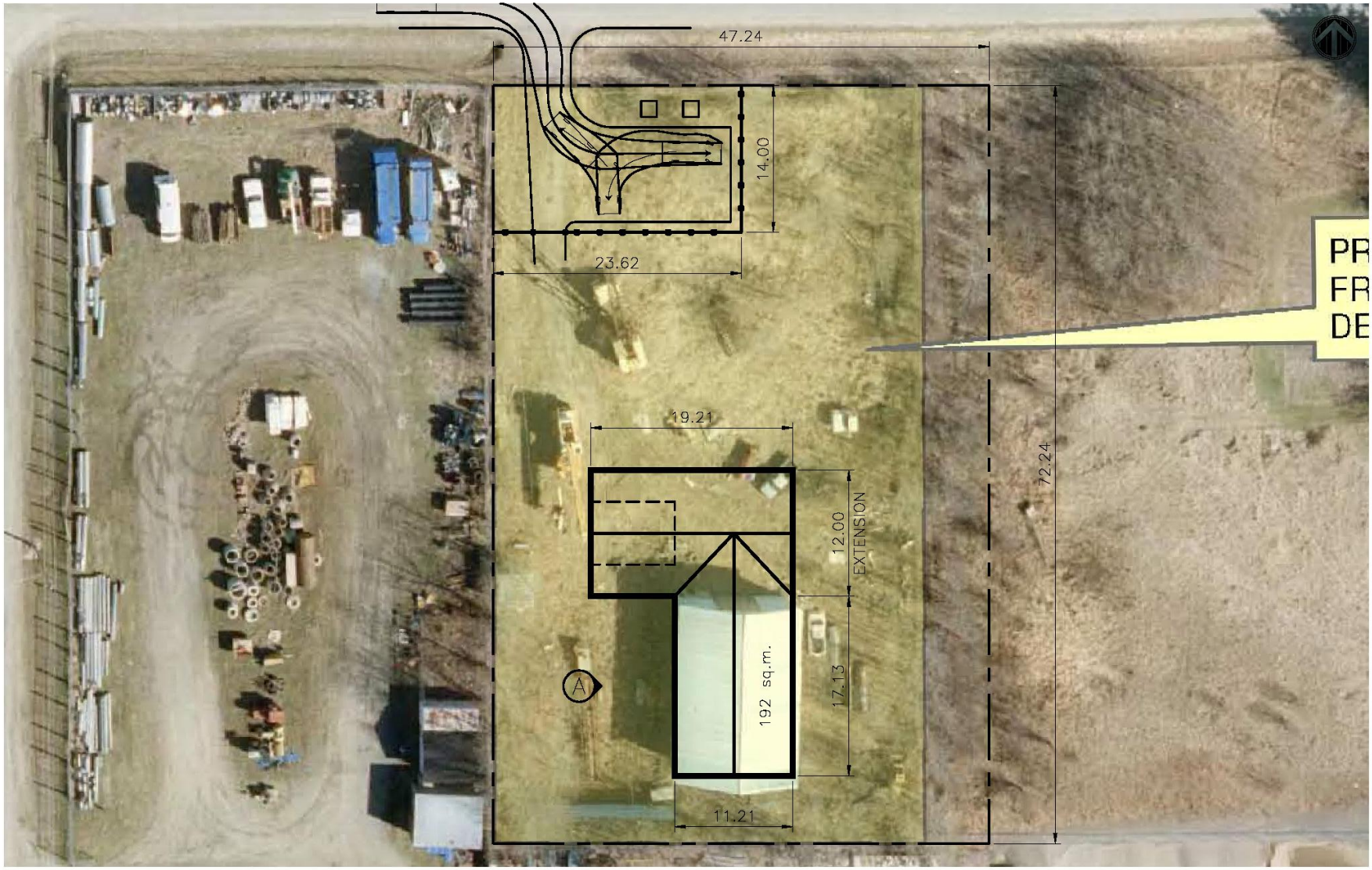
| SCALE: 1:500 | CHKD.: JS |
| DATE: DECEMBER 2008 | DWG. No.: 1 |

brif00309328a recycling transfer station.dwg

# Appendix B

## Recyclable Material Drop Off Depot
## Conceptual Site Plans

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PROJECT TITLE AND LOCATION:

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DRAWING TITLE:

SKETCH 2 – OPTION 1
PLAN & ELEVATION

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|---|---|
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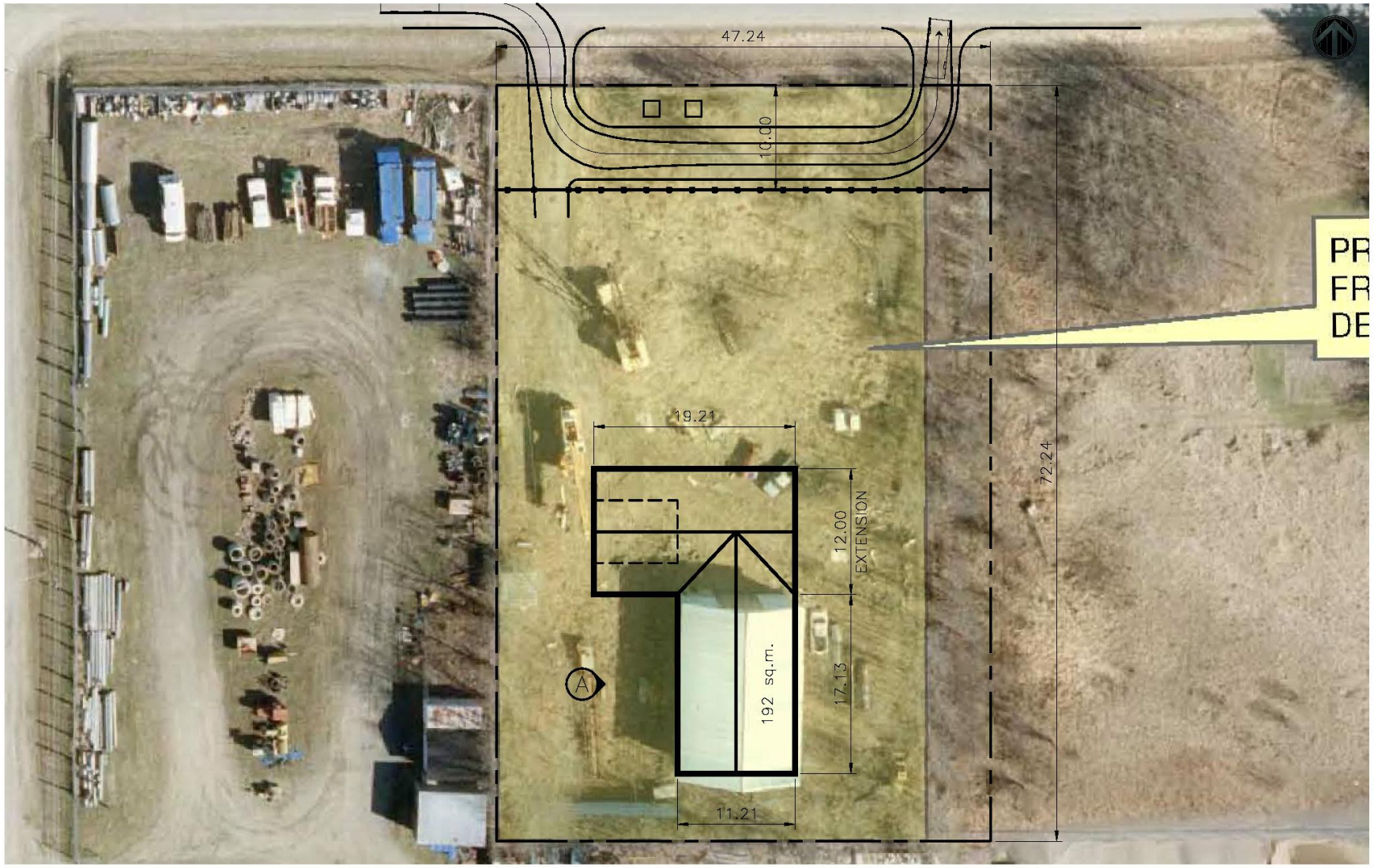


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PROJECT TITLE AND LOCATION:

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DRAWING TITLE:

SKETCH 3 – OPTION 1
PLAN & ELEVATION

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| SCALE: 1:500 | CHKD.: JS |
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