BEAUFORT-DELTA OIL PROJECT LIMITED

PRELIMINARY

BORROW SOURCE STUDY

MACKENZIE VALLEY CORRIDOR

VOLUME IV

MAP BD13 to BD17

SITE BD13-01(4)

REFERENCE:	Site 158, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Gravel, and sand, some silt (GW-GM).
OVERBURDEN:	Topsoil, discontinuous
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Possible	2,500,000 cu.m (3,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	A group of alluvial cones and one relatively small kame field located along the western toe of the McConnell Range approximately 14 km (9 mi.) southeast of Wrigley. Vegetation: sparse to relatively dense on cones; good stands of spruce, poplar and birch on kame field. Drainage: good to west. Thickness: 4.5 m (15 ft.) Area: 1,300,000 sq.m (14,000,000 sq.ft.) Perimeter: 11,000 m (17,000 ft.) Map Reference: NTS 95-O, Wrigley UTM Reference: Zone 10; 492,000E 7,005,300N
SITE INVESTIGATION:	None.
ASSESSMENT:	May be suitable for development. The source is located near the center of the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across locally rugged terrain and across undulating and depressional terrain exhibiting thermokarst features to the west.

SITE BD13-02(4)

REFERENCE:	Site 157, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Gravel and sand, some silt (GW-GM).
OVERBURDEN:	Topsoil; discontinuous
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Possible	150,000 cu.m (200,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	Two large alluvial cones located approximately 19 km (12 mi.) southeast of Wrigley along the western toe of the McConnell Range. Vegetation: moderately dense growths of spruce, poplar, and birch. Drainage: good to the west. Thickness: 4.5 m (15 ft.) Area: 1,200,000 sq.m (13,000,000 sq.ft.) Perimeter: 6,900 m (23,000 ft.) Map Reference: NTS 95-0, Wrigley UTM Reference: Zone 10; 493,000E 7,000,000N
SITE INVESTIGATION:	None.
ASSESSMENT:	May be suitable for development. The source is located near the center of the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across locally rugged terrain and across depressional and thermally sensitive terrain to the west.

SITE BD13-03(3)

REFERENCE:	Deposit (O-125), Area III DIAND Granular Resource Inventory, Wrigley NTS 95-O, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Sand, medium to fine.
RESERVES: Possible	20,000,000 cu.m (25,000,000 cu.yd.)
SITE DESCRIPTION:	Esker ridges located adjacent to the southern shore of the western end of Fish Lake.
	Thickness: 15 m (50 ft.) Area: 260,000 sq m (2,800,000 sq ft.) Perimeter: 10,000m (33,000 ft.)
	Map Reference: NTS 95-O, Wrigley.
	UTM Reference: Zone 10; 513,000E 7,001,000N
ASSESSMENT:	Suitable for development.
	The source is located adjacent to the eastern border of the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across sloping to flat terrain exhibiting slight thermokarst features locally.

SITE BD13-04(3)

REFERENCE:	Deposit 0-126,0-156, Area III DIAND Granular Resource Inventory, Wrigley NTS 95-0, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Sand and gravel;
RESERVES: Possible	6,000,000 cu.m (8,000,000 cu.yd.)
SITE DESCRIPTION:	Esker ridges located adjacent to the southern shore of Fish Lake.
	Thickness: 15 m (50 ft.) Area: 220,000 sq m (2,000,000 sq ft.) Perimeter: 16,000 m (52,000 ft.)
	Map Reference: NTS 95-0, Wrigley.
	UTM Reference: Zone 10; 527,000E 7,003,000N
ASSESSMENT:	Suitable for development.
	The source is located outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across sloping to flat terrain exhibiting slight thermokarst features.

SITE BD13-05(2)

REFERENCE:	Deposit (0-4), Area II DIAND Granular Resource Inventory, Wrigley NTS 95-O, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Sand and gravel
RESERVES: Possible	35,000,000 cu.m (45,000,000 cu.yd.)
SITE DESCRIPTION:	Glaciofluvial outwash plain located approximately 6 km (4 mi.) west of Fish Lake.
	Thickness: 15 m (50 ft.) Area: 5,600,000 sq m (60,000,000 sq ft.) Perimeter: 21,000 m (68,000 ft.)
	Map Reference: NTS 95-O, Wrigley.
	UTM Reference: Zone 10; 500,000E 6,997,500N
ASSESSMENT:	Suitable for development.
	The source is located within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across extremely rugged and steep terrain. Farther from the source the terrain is flat to rolling and exhibits thermokarst features adjacent to the Mackenzie River.

SITE ED13-06(2)

REFERENCE:	Deposit (0-4), Area II DIAND Granular Inventory, Wrigley NTS 95-O, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 2, Good quality material suitable for embankment fill, base and surface course aggregates.
MATERIAL DESCRIPTION:	Gravel
RESERVES: Possible	25,000,000 cu.m (30,000,000 cu.yd.)
SITE DESCRIPTION:	Glaciofluvial outwash plain located approximately 6 km (4 mi.) west of Fish Lake.
	Thickness: 15 m (50 ft.) Area: 3,700,000 sq m (40,000,000 sq ft.) Perimeter: 17,000 m (55,000 ft.)
	Map Reference: NTS 95-O, Wrigley.
	UTM Reference: Zone 10; 500,000E 6,998,000N
ASSESSMENT:	Suitable for development.
	The source is located within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across extremely steep and rugged terrain. Farther from the source the terrain is flat to rolling and exhibits thermokarst features adjacent to the Mackenzie River.

SITE BD13-07(4)

REFERENCE:	Site 155, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable for fair quality general fill.
MATERIAL DESCRIPTION:	Sand and gravel, silty (SM-GM).
OVERBURDEN:	Topsoil and silt
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Possible	7,000,000 cu.m (9,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	Group of alluvial river terraces located approximately 18 km (11 mi.) south of Wrigley on the west bank of the Mackenzie River adjacent to both sides of a tributary stream. Vegetation: moderately dense spruce, willow, poplar and birch on the high terrace; poorly wooded on lower terraces. Drainage: fair to good into adjacent terrain and stream. Thickness: 6 m (20 ft.) Area: 1,100,000 sq.m (12,000,000 sq.ft.) Perimeter: 8,700 m (29,000 ft.) Map Reference: NTS 95-O, Wrigley UTM Reference: Zone 10; 483,100E 6,997,000N
SITE INVESTIGATION:	None.
ASSESSMENT:	May be suitable for development as source of marginal fill. The higher terrace may contain better quality material. The source is located adjacent to the western border of the 28 km (17.5 mi.) pipeline corridor. Access require a major crossing of the Mackenzie River either by barge in the summer or truck in the winter. Access on the east side of the river

will be by truck in the winter across flat, to gently rolling poorly drained terrain exhibiting slight thermokarst features.

SITE BD13-08(3)

REFERENCE:		Site 154, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:		Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:		Gravel and sand, variable silt content, stratified (GW-SW); Maximum size 17.8 cm (7 in.); Medium moisture content.
OVERBURDEN:		Topsoil and silt; 30 cm (1 ft.)+
DEPTH OF ACTIVE LAYER:		105 cm (3.5 ft.)
RESERVES:	Proven	1,500,000 cu.m (2,000,000 cu.yd.)
	Probable	15,000,000 cu.m (20,000,000 cu.yd.)
	Possible	28,000,000 cu.m (36,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:		
METHOD OF EXTRACTION:		Rip and doze. A buffer zone of adequate width should be maintained between the Mackenzie River and the final limits of the borrow pit areas. Surficial wastes should not drain into the active Mackenzie River channel.
SITE DESCRIPTION:		Large glaciofluvial outwash plain along the east bank of the Mackenzie River, located approximately 18 km (11 mi.) south of Wrigley. Vegetation: moderately dense growths of spruce and birch. Drainage: fair to the west. Thickness: 3 m (10 ft.) Area: 9,100,000 sq.m (98,000,000 sq.ft.) Perimeter: 290,000 m (950,000 ft.) Map Reference: NTS 95-0, Wrigley UTM Reference: Zone 10; 487,900E 6,994,600N
SITE INVESTIGATION:		6 drill holes, 5 test pits.
ASSESSMENT:		Suitable for development. Selective excavation and additional crushing, screening and washing the material. Additional laboratory tests to evalu-

ate specific properties of the granular material will be required, if the material is to be considered for production of concrete aggregates.

The source lies within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat terrain exhibiting slight thermokarst features. Possible access along the Mackenzie River may be possible by barge in the summer and truck in the winter.

SITE BD13-09(4)

REFERENCE:	Site 156, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable for marginal fill.
MATERIAL DESCRIPTION:	Sand and gravel, silty (SM-GM).
OVERBURDEN:	Topsoil
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Possible	150,000 cu.m (250,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	Two shallow esker ridges located approximately 19 km (12 mi.) southeast of Wrigley. Vegetation: moderately dense stands of spruce, poplar and birch. Drainage: good. Thickness: 4.5 m (15 ft.) Area: 75,000 sq.m (810,000 sq.ft.) Perimeter: 3,700 m (12,000 ft.) Map Reference: NTS 95-O, Wrigley UTM Reference: Zone 10; 490,500E 6,997,100N
SITE INVESTIGATION:	None.
ASSESSMENT:	May be suitable for development. However, exploitation of this site would entail the stripping of large tracts of land relative to volumes of materials available. The source lies within the 20 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across depressional terrain characterized by numerous lakes and muskeg bogs.

SITE BD13-10(2)

REFERENCE:	Site 153, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 2, Good quality material suitable for embankment fill, base and surface course aggregate.
MATERIAL DESCRIPTION:	Gravel, medium grained, poor to well graded (GW-GP); Maximum size greater than 20 cm (8 in.); Low moisture content.
OVERBURDEN:	Peat and silt; 45 cm (1.5 ft.)+
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Proven	700,000 cu.m (900,000 cu.yd.)
Probable	7,000,000 cu.m (9,000,000 cu.yd.)
Possible	10,000,000 cu.m (15,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze. Surficial waste materials should not drain into the adjacent small stream channel.
SITE DESCRIPTION:	Glaciofluvial outwash plain located approximately 21 km (13 mi.) southeast of Wrigley. Vegetation: dense growths of pine, spruce and poplar to 12 m (40 ft.). Drainage: fair to the west. Thickness: 7.5 m (25 ft.) Area: 1,700,000 sq.m (18,000,000 sq.ft.) Perimeter: 7,100 m (23,000 ft.) Map Reference: NTS 95-O, Wrigley UTM Reference: Zone 10; 490,000E 6,994,400N
SITE INVESTIGATION:	4 drill holes.
ASSESSMENT:	Suitable for development as a source of quality aggregates. Additional crushing, screening and washing of the material may produce concrete aggregates. The source lies within the 28 km (17.5 mi.) pipeline corridor . Access is by truck in

the winter across poorly drained terrain exhibiting slight thermokarst features. The terrain to the northeast rises steeply to the McConnell Range.

SITE BD13-11(2)

REFERENCE:	Deposit O-3, Area III DIAND Granular Resource Inventory, Wrigley NTS 95-O, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 2, Good quality material suitable for embankment fill, base and surface course aggregate.
MATERIAL DESCRIPTION:	Gravel;
RESERVES: Possible	15,000,000 cu.m (20,000,000 cu.yd.)
SITE DESCRIPTION:	Glaciofluvial ridge deposit located adjacent to both the River between Two Mountains and Fish Lake. Thickness: 15 m (50 ft.) Area: 1,500,000 sq m (16,000,000 sq ft.) Perimeter: 6,400 m (21,000 ft.) Map Reference: NTS 95-O, Wrigley. UTM Reference: Zone 10; 510,000E 6,994,500N
ASSESSMENT:	Suitable for development. The source is located adjacent to the western boundary of the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across sloping to flat terrain exhibiting slight thermokarst features locally.

SITE BD13-12(4)

REFERENCE:	Site 150, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Sand and gravel, silty (SM-GM); Medium moisture content.
OVERBURDEN:	Topsoil
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Possible	1,000,000 cu.m (1,500,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	Kame terrace located approximately 24 km (15 mi.) southeast of Wrigley at the western toe of the McConnell Range. Vegetation: relatively dense growths of spruce and poplar. Drainage: good to the west. Thickness: 6 m (20 ft.) Area: 1,800,000 sq.m (19,000,000 sq.ft.) Perimeter: 1,800 m (6,000 ft.) Map Reference: NTS 95-O, Wrigley UTM Reference: Zone 10; 492,500E 6,991,700N
SITE INVESTIGATION:	None.
ASSESSMENT:	May be suitable for development as a source of fair quality general fill. Better quality materials, such as clean, well graded gravel, may occur in isolated pockets, which would be difficult for selective exploitation. The source lies within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter over very rugged sloping terrain and may require crossing a deeply incised erosional gully.

SITE BD13-13(4)

REFERENCE:	Site 152, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Sand and gravel, silty (SM-GM).
OVERBURDEN:	Topsoil
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Possible	5,000,000 cu.m (7,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	Outwash plain located approximately 22 km (14 mi.) southeast of Wrigley and immediately east of the Mackenzie River channel. Vegetation: moderately dense to dense growths of spruce, birch and poplar. Drainage: poor. Thickness: 4.5 m (15 ft.) Area: 5,800,000 sq.m (63,000,000 sq.ft.) Perimeter: 11,000 m (35,000 ft.) Map Reference: NTS 95-O, Wrigley UTM Reference: Zone 10; 488,500E 6,990,800N
SITE INVESTIGATION:	None.
ASSESSMENT:	May be suitable for development. The source lies within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across poorly drained, slightly rolling to flat terrain.

SITE BD13-14(3)

REFERENCE:	Site 151, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel and sand, variable silt content, stratified (GW-SW); Maximum size to 18 cm (5 in.); Low to medium moisture content.
OVERBURDEN:	Topsoil, silt and peat; 0 to 120 cm (4 ft.)
DEPTH OF ACTIVE LAYER:	120 cm (4 ft.)+
RESERVES: Proven	650,000 cu.m (900,000 cu.yd.)
Probable	4,500,000 cu.m (6,000,000 cu.yd.)
Possible	7,000,000 cu.m (9,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze. A buffer zone of adequate width should be maintained between the Mackenzie River and the final limits of the borrow pit areas.
SITE DESCRIPTION:	Glaciofluvial outwash deposit located approximately 27 km (17 mi.) south of Wrigley. Vegetation: moderately dense growths of spruce and birch. Drainage: fair to the west. Thickness: 7.5 m (25 ft.) Area: 920,000 sq.m (9,900,000 sq.ft.) Perimeter: 8,000 m (26,000 ft.) Map Reference: NTS 95-O, Wrigley UTM Reference: Zone 10; 490,000E 6,989,000N
SITE INVESTIGATION:	3 drill holes, 2 test pits.
ASSESSMENT:	Suitable for development. Selective excavation and additional crushing, screening and washing of the material may produce quality aggregates. Additional laboratory tests to evaluate specific properties of the granular material will be required, if the material is to be considered for production of concrete aggregate.

SITE BD13-15(R1)

REFERENCE:	Site 149, Fort Simpson to Wrigley Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class R-1, Bedrock suitable for manufacturing various construction aggregates.
MATERIAL DESCRIPTION:	Limestone, thickly bedded.
OVERBURDEN:	Drift and colluvium; discontinuous
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Possible	Unlimited.
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Quarry and blasting. Quarries can be located at several points along the southern and southeastern faces of the ridge.
SITE DESCRIPTION:	Bedrock massif forming a prominent ridge which is dissected by an erosion gully; approximately 5 km (3 mi.) east of the Mackenzie River and 6 km (4 mi.) north of River-Between-Two-Mountains. Vegetation: medium to dense growths of poplar and birch. Drainage: good. Map Reference: NTS 95-O, Wrigley UTM Reference: Zone 10; 493,800E 6,988,500N
SITE INVESTIGATION:	None.
ASSESSMENT:	Suitable for development as a source of good quality general fill or as a source of aggregates for base and surface course aggregates by crushing, screening of the fresh limestone. The source lies within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across very rugged and steep terrain.

SITE BD13-16(3)

REFERENCE:	Site 148, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 3, Fair quality general fill suitable for general fill.
MATERIAL DESCRIPTION:	Gravel and sand, stratified (GW-SW).
OVERBURDEN:	Topsoil
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Possible	10,000,000 cu.m (15,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	Several kame terraces and kame fields paralleling the western toe of the McConnell Range, approximately 6 km (4 mi.) north of the River-Between-Two-Mountains. Vegetation: relatively dense growths of spruce, poplar and birch. Drainage: fair to good to adjacent terrain, localized depressions. Thickness: 6 m (20 ft.) Area: 2,100,000 sq.m (23,000,000 sq.ft.) Perimeter: 25,000 m (85,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 497,500E 6,988,500N
SITE INVESTIGATION:	None.
ASSESSMENT:	May be suitable for development as a source of general fill and possibly for both base and surface course aggregates. The source is located near the center of the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across rugged irregular terrain.

SITE BD13-17(3)

REFERENCE:	Site 147, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Sand, gravel and silt (SW-GW).
OVERBURDEN:	Topsoil and silt; varying thickness
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Possible	7,500,000 cu.m (10,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	High fluvial terrace paralleling the eastern bank of the Mackenzie River opposite Old Fort Island and approximately 5 km (3 mi.) north of the River-Between-Two-Mountains. Drainage: good to the west. Thickness: 6 m (20 ft.) Area: 1,400,000 sq.m (15,000,000 sq.ft.) Perimeter: 7,800 m (76,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 488,400E 6,984,600N
SITE INVESTIGATION:	None.
ASSESSMENT:	Suitable for development. However, the deposits within the terrace are of variable quality and exploitation would entail selective operations if quality general fill material is required. The source lies within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across gently sloping terrain.

SITE BD13-18(2)

REFERENCE:	Site 146, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 2, Good quality material suitable for embankment fill, base and surface course aggregate.
MATERIAL DESCRIPTION:	Sand and gravel, trace silt, well graded, medium to coarse grained (SW-GW); Maximum size greater than 20 cm (8 in.); Low moisture content.
OVERBURDEN:	Topsoil; 60 cm (2 ft.)
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Proven	70,000 cu.m (90,000 cu.yd.)
Probable	450,000 cu.m (600,000 cu.yd.)
Possible	1,000,000 cu.m (1,500,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze. Borrow pit development should be initiated in the ridges removed from existing lakes and ponds. Vertical excavation should be considered to minimize erosion. Surficial waste material should not drain into the adjacent lakes. The final level of the borrow area should be maintained above level of adjacent lakes.
SITE DESCRIPTION:	Discontinuous esker ridge complex located approximately 32 km (20 mi.) southeast of Wrigley. Vegetation: moderate growths of spruce. Drainage: good to the west. Thickness: 6 m (20 ft.) Area: 330,000 sq.m (3,500,000 sq.ft.) Perimeter: 7,300 m (24,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 492,400E 6,983,800N
SITE INVESTIGATION:	7 drill holes.
ASSESSMENT:	Suitable for development.

SITE BD13-18(2)

The source lies within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across rolling terrain.

SITE BD13-19(NG)

REFERENCE:	Site 145X, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class NG, Non-granular material unsuitable for construction purposes.
MATERIAL DESCRIPTION:	Silt, sand and clay, stratified (ML-CL).
SITE DESCRIPTION:	Alluvial fan and terrace which is located at the mouth of the River-Between-Two-Mountains, approximately 35 km (22 mi.) southeast of Wrigley.
	Vegetation: dense growths of spruce and tamarack.
	Drainage: good to adjacent stream.
	Map Reference: NTS 95J, Camsell Bend
	UTM Reference: Zone 10; 489,400E 6,979,200N
SITE INVESTIGATION:	2 drill holes.
ASSESSMENT:	Material is not suitable for construction purposes.

SITE BD13-20(4)

REFERENCE:	Site 144, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable for marginal fill.
MATERIAL DESCRIPTION:	Sand and gravel, silty (SM-GM).
OVERBURDEN:	Topsoil
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Possible	100,000 cu.m (150,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	Small esker ridge paralleling the river channel, located immediately south of the River-Between-Two Mountains. Vegetation: spruce, poplar, birch and pine. Drainage: good to the northwest. Thickness: 6 m (20 ft.) Area: 29,000 sq.m (320,000 sq.ft.) Perimeter: 1,100 m (3,800 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 493,500E 6,978,000N
SITE INVESTIGATION:	None.
ASSESSMENT:	May be suitable for development although stripping of large tracts of land relative to the quantity of materials available would be required. The source lies within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across rolling terrain.

SITE BD13-21(3)

REFERENCE:	Site 143, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel, some sand, variable grading, medium grained (GM-GP); Maximum size greater than 20 cm (8 in.); Medium to high moisture content.
OVERBURDEN:	Topsoil and silt; 60 cm (2 ft.) to 150 cm (5 ft.)
DEPTH OF ACTIVE LAYER:	130 cm (4.5 ft.)
RESERVES: Proven	500,000 cu.m (750,000 cu.yd.)
Probable	2,000,000 cu.m (2,500,000 cu.yd.)
Possible	2,500,000 cu.m (3,500,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze. Borrow pit development should be initiated where there are proven depths of gravel farthest from the water course. A buffer zone of adequate width should be maintained between the stream and the final limits of the borrow pit. Surficial waste materials should not drain into the active stream channel of the River Between Two Mountains or into adjacent lakes.
SITE DESCRIPTION:	Glacial outwash deposit adjacent to the north bank of River-Between-Two-Mountains with the occasional small esker ridge remnant, located approximately 37 km (23 mi.) southeast of Wrigley. Vegetation: spruce and birch, moss and small shrubs. Drainage: fair to good to the north and south. Thickness: 3 m (10 ft.) Area: 1,100,000 sq.m (11,000,000 sq.ft.) Perimeter: 9,600 m (32,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 496,800E 6,977,600N

SITE BD13-21(3)

SITE INVESTIGATION: 9 drill holes, 1 test pit.

ASSESSMENT: Suitable for development as a source of pit run aggregates utilized in building pads and subbase construction. However, if careful and selective excavating procedures are utilized then pockets of gravel could be exploited for use in production of base and surface course aggregates.

The source lies near the center of the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat to gently rolling terrain containing a couple of large lakes.

SITE BD13-22(3)

REFERENCE:	Site 143A, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Sand and gravel (SW-GW).
OVERBURDEN:	Topsoil
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Possible	6,000,000 cu.m (7,500,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	Glaciofluvial outwash plain located south of the alluvial flood plain of the River Between Two Mountains at the Eastern toe of the McConnell Range. Vegetation: spruce, poplar and birch. Drainage: fair to good to adjacent terrain and streams. Thickness: 3 m (10 ft.) Area: 1,900,000 sq.m (20,000,000 sq.ft.) Perimeter: 5,900 m (20,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 501,300E 6,976,500N
SITE INVESTIGATION:	None.
ASSESSMENT:	May be suitable for development. The source is located near the center of the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across rolling to rugged terrain. The McConnell Range may have to be crossed.

SITE BD13-23(3)

REFERENCE:		Site 142, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:		Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:		Gravel and sand, variable gradation, fine to medium grained (GW-GP); Maximum size greater than 20 cm (8 in.); Low moisture content.
OVERBURDEN:		Topsoil and silt, 30 cm (1 ft.)+
DEPTH OF ACTIVE LAYER:		140 cm (4.5 ft.)
RESERVES:	Proven	100,000 cu.m (150,000 cu.yd.)
	Probable	10,000,000 cu.m (15,000,000 cu.yd.)
	Possible	15,000,000 cu.m (22,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:		
METHOD OF EXTRACTION:		Rip and doze. Development should commence farthest from the water course. A buffer zone of adequate width should be maintained between the stream and the final limits of the borrow area.
SITE DESCRIPTION:		Large esker and kame terrace field located approximately 40 km (25 mi.) southeast of Wrigley. Vegetation: spruce and birch. Drainage: well drained to adjacent terrain. Thickness: 6.5 m (25 ft.) Area: 4,400,000 sq.m (47,000,000 sq.ft.) Perimeter: 32,000 m (100,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 495,100E 6,973,200N
SITE INVESTIGATION:		10 drill holes, 1 test pit.
ASSESSMENT:		Suitable for development as a source of pit run aggregates utilized in building pads and subbase construction. However if carefull and selective excavating procedures are used then pockets of gravel could be exploited for use in production of base and surface course aggregates.

SITE BD13-23(3)

The source lies within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, poorly drained terrain which exhibits slight thermokarst condition.

This site requires a comprehensive field investigation to delineate and confirm the quantity and quality of the available materials.

SITE BD13-24(3)

REFERENCE:	Deposit J-66, DIAND Granular Resource Inventory; Camsell Bend NTS 95J, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Sand and gravel.
RESERVES: Possible	100,000 cu.m (150,000 cu.yd.)
SITE DESCRIPTION:	Esker ridge located approximately 14 km (9 mi.) west of Greasy Lake.
	Thickness: 15 m (50 ft.) Area: 70,000 sq m (750,000 sq ft.) Perimeter: 3,000 m (10,000 ft.)
	Map Reference: NTS 95J, Camsell Bend
	UTM Reference: Zone 10; 521,500E 6,973,000N
ASSESSMENT:	Suitable for development.
	The source is located outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat terrain.

SITE BD13-25(3)

REFERENCE:	Deposit J-98, J-101, Area VIII DIAND Granular Resource Inventory; Camsell Bend NTS 95J, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Sand and silt (possible gravel).
RESERVES: Possible	Not determined.
SITE DESCRIPTION:	Alluvail terraces on the west bank of the Mackenzie River located approximately 10 km (6 mi.) upstream of the confluence of the Willowlake River. Thickness: 12 m (40 ft.) Area: 36,000,000 sq m (390,000,000 sq ft.) Perimeter: 24,000 m (78,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 487,500E 6,966,500N
ASSESSMENT:	Suitable for limited development of portion of source farthest removed from active channel of the Mackenzie River. The source is located adjacent to the western border of the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat to rolling locally thermokarst terrain. Access includes crossing the Mackenzie River by truck in the winter or by barge in the summer. A barging operation may require stockpiling because of seasonal land access.

SITE BD13-26(2)

REFERENCE:	Deposit J-60, Area I DIAND Granular Resource Inventory, Camsell Bend NTS 95J, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 2, Good quality material suitable for embankment fill, base and surface course aggregates.
MATERIAL DESCRIPTION:	Sand and gravel.
RESERVES: Possible	55,000,000 cu.m (75,000,000 cu.yd.)
SITE DESCRIPTION:	Hummocky and channelled glaciofluvial plain with esker ridge located approximately 13 km (8 mi.) northeast of the confluence of the Willowlake and Mackenzie Rivers. Thickness: 4.5 m (15 ft.) Area: 20,000,000 sq m (210,000,000 sq ft.) Perimeter: 35,000 m (110,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 504,000E 6,968,000N
ASSESSMENT:	Suitable for development. The glaciofluvial plain deposit is a source of good quality material and the esker is a source of fair quality material. The source is located within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat to rolling terrain.

SITE BD13-27(3)

REFERENCE:	Site 141, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel and sand (GW-SW); Scattered pockets.
OVERBURDEN:	Topsoil.
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Possible	2,500,000 cu.m (3,500,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	Large kame-esker complex located between the McConnell Range and Willow Ridge and approximately half way between the Willowlake River and River Between Two Mountains. Vegetation: good stands of spruce. Drainage: fair. Thickness: 7.5 m (25 ft.) Area: 710,000 sq.m (7,600,000 sq.ft.) Perimeter: 28,000 m (93,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 504,000E 6,962,100N
SITE INVESTIGATION:	None.
ASSESSMENT:	May be suitable for development. The source lies near the center of the 28 km (17.5 mi.) pipeline corridor. Access is very difficult as the McConnell Range may have to be crossed to reach the pipeline.

SITE BD13-28(3)

REFERENCE:	Deposit J-67, DIAND Granular Resource Inventory; Camsell Bend NTS 95I, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Sand and gravel.
RESERVES: Possible	10,000 cu.m (15,000 cu.yd.)
SITE DESCRIPTION:	Esker ridge located approximately adjacent to the southern shore of Highland Lake.
	Thickness: 12 m (50 ft.) Area: 35,000 sq m (380,000 sq ft.) Perimeter: 3,000 m (10,000 ft.)
	Map Reference:
	UTM Reference: Zone 10; 530,000E 6,960,500N
ASSESSMENT:	Suitable for development.
	The source is located outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat terrain.

SITE BD13-29(4)

REFERENCE:	Deposit (J-100), DIAND Granular Resource Inventory; Camsell Bend NTS 95J, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Sand and silt.
RESERVES: Possible	750,000 cu.m (1,000,000 cu.yd.)
SITE DESCRIPTION:	Alluvial terrace on the east bank of the Mackenzie River immediately upstream of the confluence of the Willowlake and Mackenzie Rivers. Thickness: 3 m (10 ft.) Area: 2,800,000 sq m (30,000,000 sq ft.) Perimeter: 20,000 m (67,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 493,000E 6,960,000N
ASSESSMENT:	Suitable for limited development. The portion of the source farthest removed from the active channel of the Mackenzie River be developed first. The source is located inside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, locally thermokarst terrain.

SITE BD13-30(2)

REFERENCE:	Deposit J-99, Area VIII DIAND Granular Resource Inventory; Camsell Bend NTS 95J, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 2, Good quality material suitable for embankment fill, base and surface course aggregate.
MATERIAL DESCRIPTION:	Gravel.
RESERVES: Possible	3,500,000 cu.m (4,500,000 cu.yd.)
SITE DESCRIPTION:	Alluvial plain deposit forming an island in the main channel of the Mackenzie River approximately 8 km (5 mi.) upstream of the confluence of the Willowlake River. Thickness: 12 m (40 ft.) Area: 1,500,000 sq m (16,000,000 sq ft.) Perimeter: 4,100 m (14,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 490,000E 6,960,000N
ASSESSMENT:	Not suitable for development because all available granular materials are located within the active stream channel of the Mackenzie River. The source is located adjacent to the western border of the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter or by barge in the summer across the Mackenzie River.

SITE BD13-31(4)

REFERENCE:	Site 133, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973,
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Gravel and sand, silty, (washed till), (GM); Maximum size.
OVERBURDEN:	Topsoil and silt
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Possible	6,500,000 cu.m (9,500,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Not applicable.
SITE DESCRIPTION:	Fluvial deposits forming an island, located within the Mackenzie River channel, approximately 5 km (3 mi.) downstream from the Willowlake River confluence. Vegetation: good stands of spruce mixed with poplar and birch. Drainage: into adjacent river arms. Thickness: 4.5 m (15 ft.) Area: 1,400,000 sq.m (15,000,000 sq.ft.) Perimeter: 5,500 m (18,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 492,000E 6,957,600N
SITE INVESTIGATION:	None.
ASSESSMENT:	Not suitable for development because of difficult access and high environmental sensitivity. The source is located adjacent to the western border of the 28 km (17.5 mi.) pipeline corridor.

SITE BD13-32(4)

REFERENCE:	Site 140, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable for very marginal fill.
MATERIAL DESCRIPTION:	Sand, coarse grained, highly variable silt and clay content, little gravel (SM-SP); Maximum size greater than 20 cm (8 in.).
OVERBURDEN:	Topsoil; 30 cm (1 ft.)
DEPTH OF ACTIVE LAYER:	60 cm (2 ft.)+
RESERVES: Proven	850,000 cu.m (1,000,000 cu.yd.)
Probable	3,000,000 cu.m (4,000,000 cu.yd.)
Possible	4,500,000 cu.m (6,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze. Surficial waste materials should not drain into adjacent lakes or stream channels. Selective excavation may be necessary because of the highly variable quality of the in situ sand strata.
SITE DESCRIPTION:	Glaciofluvial outwash deposit located approximately 2 km (1¼ mi.) north of the Willowlake River. Vegetation: moderately dense growths of spruce and birch. Drainage: fair to the southwest. Thickness: 6 m (20 ft.) Area: 740,000 sq.m (7,900,000 sq.ft.) Perimeter: 3,900 m (13,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 495,100E 6,955,400N
SITE INVESTIGATION:	4 drill holes.
ASSESSMENT:	May be suitable for development. The source lies within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat terrain partially incised by shallow stream channels.

SITE BD13-33(2)

REFERENCE:		Site 139, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:		Class 2, Good quality material suitable for embankment fill, base and surface course aggregate.
MATERIAL DESCRIPTION:		Sand and gravel, fine to medium grained, well graded (SW-GW); Maximum size 5.1 cm (2 in.) Low to medium moisture content.
OVERBURDEN:		Topsoil and silty sand; 30 cm (1 ft.) to 120 cm (4 ft.)
DEPTH OF ACTIVE LAYER:		5 m (15 ft.)+
RESERVES:	Proven	50,000 cu.m (70,000 cu.yd.)
	Probable	1,000,000 cu.m (1,500,000 cu.yd.)
	Possible	5,000,000 cu.m (7,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:		
METHOD OF EXTRACTION:		Rip and doze. Borrow pit development should be initiated from the eastern extremities, farthest removed from the adjacent lakes. Surficial waste materials should not drain into the adjacent lakes. Ponding of water should be prevented by proper contouring to decrease possibility of partial thermokarst subsidence.
SITE DESCRIPTION:		Series of small esker ridge or kame terrace remnants located approximately 4 km (2½ mi.) north of Willowlake River. Vegetation: moderate growth of poplar, birch, pine and spruce to 9 m (30 ft.) in height. Drainage: fair to the northwest. Thickness: 7.5 m (25 ft.) Area: 1,400,000 sq.m (15,000,000 sq.ft.) Perimeter: 13,000 m (42,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 500,800E 6,953,000N
SITE INVESTIGATION:		4 drill holes.

SITE BD13-33(2)

ASSESSMENT: Suitable for development.

The source lies within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across poorly drained muskeg terrain and small lakes.

SITE BD13-34(3)

REFERENCE:	Deposit J-63, J-64, Area I, DIAND Granular Resource Inventory; Camsell Bend NTS 95J, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Sand and gravel, grain size analysis of sample #GM87 indicated a till like material.
RESERVES: Possible	100,000,000 cu.m (150,000,000 cu.yd.)
SITE DESCRIPTION:	Hummocky and channelled glaciofluvial plain with esker ridges located approximately 14 km (9 mi.) east of the confluence of the Willowlake and Mackenzie Rivers. Thickness: 4.5 m (15 ft.) Area: 36,000,000 sq m (390,000,000 sq ft.) Perimeter: 63,000 m (210,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 510,000E 6,955,000N
ASSESSMENT:	Suitable for development. The source is located inside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat to rolling, slightly thermo-karst terrain.

SITE BD13-34(3)

REFERENCE:	Deposit J-63, J-64, Area I, DIAND Granular Resource Inventory; Camsell Bend NTS 95J, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Sand and gravel, grain size analysis of sample #GM87 indicated a till like material.
RESERVES: Possible	100,000,000 cu.m (150,000,000 cu.yd.)
SITE DESCRIPTION:	Hummocky and channelled glaciofluvial plain with esker ridges located approximately 14 km (9 mi.) east of the confluence of the Willowlake and Mackenzie Rivers.
	Thickness: 4.5 m (15 ft.) Area: 36,000,000 sq m (390,000,000 sq ft.) Perimeter: 63,000 m (210,000 ft.)
	Map Reference: NTS 95J, Camsell Bend
	UTM Reference: Zone 10; 510,000E 6,955,000N
ASSESSMENT:	Suitable for development.
	The source is located inside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat to rolling, slightly thermo-karst terrain.

SITE BD13-35(NG)

REFERENCE:	Site 138X, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class NG, Not suitable for construction purposes.
MATERIAL DESCRIPTION:	Silt and clay, gravel pockets, (glacial till) (ML-CL); Medium to low moisture content.
DEPTH OF ACTIVE LAYER:	Not determined.
SITE DESCRIPTION:	Drumloid moraine field located adjacent to the north bank of Willowlake River. Vegetation: moderately dense growths of spruce, pine and poplar to 12 m (40 ft.) high. Drainage: poor. Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 501,500E 6,951,000N
SITE INVESTIGATION:	4 drill holes.
ASSESSMENT:	Material is not suitable for construction purposes.

SITE BD13-36(NG)

REFERENCE:	Site 132X, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class NG, Non-granular material unsuitable for construction purposes.
MATERIAL DESCRIPTION:	Sand, varying silt content, fine grained, poorly graded (SM-SP); Maximum size greater than 20 cm (8 in.).
DEPTH OF ACTIVE LAYER:	100 cm (3.5 ft.)+
SITE DESCRIPTION:	Slighly elevated fluvial flood plain, located on McGern Island opposite the mouth of Willow-lake River. Vegetation: moderately dense growths of spruce, birch and poplar. Drainage: fair into adjacent river. Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 491,100E 6,953,200N
SITE INVESTIGATION:	2 test pits.
ASSESSMENT:	Material is not suitable for construction purposes.

SITE BD13-37(NG)

REFERENCE:	Site 134X, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class NG, Non-granular material not suitable for construction purposes.
MATERIAL DESCRIPTION:	Sand, little silt, fine grained, poorly graded (SM-SP); High moisture content.
DEPTH OF ACTIVE LAYER:	420 cm (7 ft.)+
SITE DESCRIPTION:	Slightly undulating plateau located immediately adjacent to the south bank of the Willowlake River. Vegetation: moderately dense growths of spruce, pine and birch to 12 m (40 ft.) high. Drainage: good to north and east. Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 495,600E 6,951,300N
SITE INVESTIGATION:	3 drill holes, 2 test pits.
ASSESSMENT:	Material is not suitable for construction purposes.

SITE BD13-38(4)

REFERENCE:		Site 135X, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:		Class 4, Poor quality material suitable only for very marginal fill.
MATERIAL DESCRIPTION:		Sand, little silt, fine grained, poorly graded (SP-SM); High moisture content.
OVERBURDEN:		Topsoil and silt; 30 cm (1 ft.)
DEPTH OF ACTIVE LAYER:		300 cm (10 ft.)+
RESERVES:	Proven	1,000,000 cu.m (1,500,000 cu.yd.)
	Probable	5,500,000 cu.m (7,500,000 cu.yd.)
	Possible	7,500,000 cu.m (10,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:		
METHOD OF EXTRACTION:		Rip and doze. The borrow pit should be initiated away from the steep banks along the northeastern perimeter of the site. Pit walls should be sloped at 3 horizontal to 1 vertical to ensure stability and prevent localized slides. The depths of the borrow pit excavation will be governed to depths where groundwater seepage may be encountered.
SITE DESCRIPTION:		Slightly undulating plateau containing deltaic sands, located 1½ km (1 mi.) south of Willow River. Vegetation: moderately dense growths of spruce, birch and pine to 12 m (40 ft.) in height. Drainage: good to the north and east. Thickness: 7.5 m (25 ft.) Area: 1,000,000 sq.m (11,000,000 sq.ft.) Perimeter: 4,100 m (14,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 497,300E 6,949,300N
SITE INVESTIGATION:		4 drill holes.
ASSESSMENT:		May be suitable for development.

SITE BD13-38(4)

The source lies within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across slightly depressional terrain with scattered muskeg bogs and small, shallow ponds indicating terrain conditions which are partially sensitive to thermal erosion.

SITE BD13-39(4)

REFERENCE:	Site 136X, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Silt and sand, with exposed gravel bars (GM-GP); Maximum size #10 sieve.
OVERBURDEN:	Peat and silt; 30 cm (1 ft.)+
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Proven	80,000 cu.m (100,000 cu.yd.)
Probable	8,000,000 cu.m (10,000,000 cu.yd.)
Possible	25,000,000 cu.m (30,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Not applicable.
SITE DESCRIPTION:	Low alluvial terraces and gravel bars located within the active stream channel of Willowlake River.
	Drainage: poor into adjacent stream channel.
	Thickness: 4.5 m (15 ft.) Area: Zone 10; 498,500E 6,950,000N Perimeter: 18,000 m (58,000 ft.)
	Map Reference: NTS 95J, Camsell Bend
	UTM Reference: Zone 10; 498,500E 6,950,000N
SITE INVESTIGATION:	1 drill hole.
ASSESSMENT:	Not suitable for development because the layer or pockets of exploitable granular materials are located within or immediately adjacent to the active stream channel of Willowlake River. The source lies within the 28 km (17.5 mi.) pipeline corridor.

SITE BD13-40(NG)

REFERENCE:	Site 137X, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class NG, Non-granular material unsuitable for construction purposes.
MATERIAL DESCRIPTION:	Silt, some sand and clay with pebbles, sand and gravel pockets (glacial till) (ML-CL); Medium moisture content.
SITE DESCRIPTION:	Drumloid glacial moraine containing pockets of glaciofluvial material, located immediately adjacent to the north bank of Willowlake River.
	Vegetation: moderate to dense growths of spruce, pine, poplar and willow.
	Drainage: poor.
	Map Reference: NTS 95J, Camsell Bend
	UTM Reference: Zone 10; 503,000E 6,948,000N
SITE INVESTIGATION:	9 drill holes.
ASSESSMENT:	Material is not suitable for construction purposes.

SITE BD13-41(3)

REFERENCE:	Deposit J-159,J-160, J-161, Area I DIAND Granular Resource Inventory; Camsell Bend NTS 95J, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel and sand.
RESERVES: Possible	10,000,000 cu.m (15,000,000 cu.yd.)
SITE DESCRIPTION:	Alluvial plain of the Willowlake River, located approximately 18 km (11 mi.) east of its confluence with the Mackenzie River.
	Thickness: 12 m (40 ft.) Area: 4,600,000 sq m (50,000,000 sq ft.) Perimeter: 19,000 m (62,000 ft.)
	Map Reference: NTS 95J, Camsell Bend.
	UTM Reference: Zone 10; 515,000E 6,950,000N
ASSESSMENT:	Suitable for development on a limited scale on portions of the source located farthest from the active stream channel.
	The source is located near the center of the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, locally thermokarst terrain.

SITE BD13-42(4)

REFERENCE:	Deposit J-96, Area VIII DIAND Granular Resource Inventory; Camsell Bend NTS 95J, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Sand and silt, (possible gravel).
RESERVES: Possible	2,500,000 cu.m (3,000,000 cu.yd.)
SITE DESCRIPTION:	Alluvial terrace on McGern Island located in the Mackenzie River opposite the confluence of the Willowlake River and Mackenzie River.
	Thickness: 12 m (40 ft.) Area: 1,300,000 sq m (14,000,000 sq ft.) Perimeter: 22,000 m (73,000 ft.)
	Map Reference: NTS 95J, Camsell Bend
	UTM Reference: Zone 10; 490,000E 6,943,000N
ASSESSMENT:	Not suitable for development because of excessive siltation of the Mackenzie River may result from excavation of the granular materials, also access is very difficult.
	The source is lcoated outside the 28 km (17.5 mi.) Pipeline Corridor.

SITE BD13-43(NG)

REFERENCE:	Site 131X, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class NG, Non-granular material unsuitable for construction purposes.
MATERIAL DESCRIPTION:	Glacial till, reworked; Maximum size greater than 20 cm (8 in.).
DEPTH OF ACTIVE LAYER:	Not determined.
SITE DESCRIPTION:	Two narrow and eroded till ridges which are adjacent to an erosional gully, located approximately 13 km (8 mi.) south of the Willowlake River. Vegetation: dense growths of spruce to 6 m (20 ft.) high. Drainage: well drained to adjacent terrain. Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 500,900E 6,940,700N
SITE INVESTIGATION:	2 drill holes.
ASSESSMENT:	Material is not suitable for construction purposes.

SITE BD13-44(4)

REFERENCE:	Site 129, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for very marginal fill.
MATERIAL DESCRIPTION:	Gravel and sand, silty (washed till), (GM).
OVERBURDEN:	Silt; relatively thick.
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Possible	18,000,000 cu.m (24,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Not applicable.
SITE DESCRIPTION:	Southern tip of McGern Island, located within the broad Mackenzie River channel, approximately 16 km (10 mi.) upstream from the mouth of Willow-lake River. Vegetation: good stands of spruce mixed with poplar and birch. Drainage: into adjacent river arms. Thickness: 6 m (20 ft.) Area: 250,000 sq.m (2,800,000 sq.ft.) Perimeter: 8,700 m (29,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 498,500E 6,937,700N
SITE INVESTIGATION:	None.
ASSESSMENT:	Not suitable for development because of difficult access and excessive distances to pipeline route.

SITE BD13-45(NG)

REFERENCE:	Site 130X, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class NG, Non-granular material unsuitable for construction purposes.
MATERIAL DESCRIPTION:	Silt, some sand and clay, (glacial till); (ML-MH); Low to medium moisture content.
SITE DESCRIPTION:	Two erosional remnants of the glacial till sheet, located approximately 14 km (9 mi.) south of the Willowlake River. Vegetation: moderately dense growths of spruce and scattered clusters of birch. Drainage: fair to the adjacent terrain. Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 493,500E 6,937,200N
SITE INVESTIGATION:	2 drill holes.
ASSESSMENT:	Material is not suitable for construction purposes.

SITE BD13-46(4)

REFERENCE:	Deposit (J-92), Area VI DIAND Granular Resource Inventory, Camsell Bend NTS 95J, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Sand and silt, some gravel.
RESERVES: Possible	65,000,000 cu.m (85,000,000 cu.yd.)
SITE DESCRIPTION:	Alluvial terrace on the east bank of the Mackenzie River, located approximately 8 km (5 mi.) downstream of the confluence of the Willowlake and Mackenzie Rivers. Thickness: 15 m (40 ft.) Area: 26,000,000 sq m (280,000,000 sq ft.) Perimeter: 57,000m (190,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 489,000E 6,932,000N
ASSESSMENT:	Suitable for development. The source is located well outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, slightly thermokarst terrain.

SITE BD13-47(NG)

REFERENCE:	Site 128X, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class NG, Non-granular materials not suitable for construction purposes.
MATERIAL DESCRIPTION:	Silt, some clay, (Glacial till), (ML-CL).
SITE DESCRIPTION:	Group of flat topped erosional remnants of the glacial till sheet, located 22 km (14 mi.) south of Willowlake River. Vegetation: dense clustered growths of birch and poplar with light growths of spruce. Drainage: poorly drained to the west. Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 497,900E 6,931,600N
SITE INVESTIGATION:	4 drill holes.
ASSESSMENT:	Material is not suitable for construction purposes.

SITE BD13-48(R2)

REFERENCE:	Site 127, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class R-2, Bedrock suitable for fair quality general fill in sub-grades.
MATERIAL DESCRIPTION:	Limestone with minor siltstone and shale inclusions.
OVERBURDEN:	Topsoil and silt; thick
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Possible	Unlimited.
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Quarry and blasting.
SITE DESCRIPTION:	Large bedrock ridge covered with galciolacustrine deposits, located approximately 2½ km (1½ mi.) east of the Mackenzie River.
	Vegetation: dense stands of poplar, alder and birch.
	Drainage: good.
	Map Reference: NTS 95J, Camsell Bend
	UTM Reference: Zone 10; 491,000E 6,931,500N
SITE INVESTIGATION:	None.
ASSESSMENT:	May be suitable for development although overburden is thick and may limit the economic exploitation of the source.
	The source lies well outside the 28 km (17.5 mi.) pipeline corridor. Access is extremely difficult because of thermally sensitive terrain and will be by truck in the winter.

SITE BD13-49(R2)

REFERENCE:	Site 126, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class R-2, Bedrock suitable for fair quality general fill in sub-grades.
MATERIAL DESCRIPTION:	Limestone interbedded with siltstone and shale. The shale may be quite prominent.
OVERBURDEN:	Topsoil and silt.
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Possible	Unlimited.
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Quarry and blasting.
SITE DESCRIPTION:	Bedrock ridge covered by glaciolacustrine deposits, located approximately 13 km (8 mi.) south of Willowlake River. Vegetation: dense. Drainage: good to fair into adjacent terrain. Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 493,500E 6,925,400N
SITE INVESTIGATION:	None.
ASSESSMENT:	May be suitable for development provided additional field investigations are undertaken. The source lies well outside the 28 km (17.5 mi.) pipeline corridor. Access is extremely difficult and will be by truck in the winter across thermally sensitive terrain.

SITE BD13-50(R2)

REFERENCE:	Borrow Area GM120 Main Canadian Route, CAGSL Pipeline Related Borrow Studies; Northern Engineering Services Co. Ltd., 1974.
MATERIAL QUALITY:	Class R2, Bedrock suitable for fair quality general fill in sub-grades.
MATERIAL DESCRIPTION:	Limestone, siltstone and shale.
OVERBURDEN:	Topsoil and silt; 0 to 350 cm (7 ft.)
RESERVES: Possible	Unlimited
MINIMUM HAUL DISTANCE:	
SITE DESCRIPTION:	Near surface bedrock, forming a plateau located approximately 14 km (9 mi.) west of the confluence of the Willowlake and Mackenzie Rivers.
	Drainage: good down slope
	Map Reference: NTS 95J, Camsell Bend
	UTM Reference: Zone 10; 480,000E 6,948,500N
SITE INVESTIGATION:	None
ASSESSMENT:	Suitable for development as a source of general fill.
	The source is located well outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat thermokarst terrain. Access includes crossing the Mackenzie River either by barge in the summer or truck in the winter. A barging operation may require stockpiling because of seasonal land access.
	Selected by CAGSL as a primary source of material for construction of a facility.

SITE BD14-01(3)

REFERENCE:	Deposit J-66A, Area VII DIAND Granular Resource Inventory; Camsell Bend NTS 95J, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel and sand.
RESERVES: Possible	25,000 cu.m (30,000 cu. yd.)
SITE DESCRIPTION:	Esker ridge located approximately 20 km (13 mi.) southeast of Highland Lake.
	Thickness: 15 m (50 ft.) Area: 42,000 sq m (450,000 sq ft.) Perimeter: 4,000 m (13,000 ft.)
	Map Reference: NTS 95J, Camsell Bend
	UTM Reference: Zone 10; 551,000E 6,954,000N
ASSESSMENT:	Suitable for development.
	The source is located outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat to gently sloping terrain. Willowlake River may have to be crossed to gain access to the pipeline route.

SITE BD14-02(3)

REFERENCE:	Deposit I-26, DIAND Granular Resource Inventory; Bulmer Lake NTS 95I, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Sand and gravel.
RESERVES: Possible	1,500,000 cu. m (2,000,000 cu.yd.)
SITE DESCRIPTION:	Alluvial flood plain and adjacent low terraces of the upstream portion of a tributary of the Willowlake River, located approximately 27 km (17 mi.) ESE of Highland Lake. Area: 9,300 sq m (100,000 sq ft.) Perimeter: 17,000 m (55,000 ft.) Map Reference: NTS 95-I, Bulmer Lake UTM Reference: Zone 10; 557,500E 6,953,500N
ASSESSMENT:	Suitable for development. The source is located outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter over flat, thermokarst terrain.

SITE BD14-03(3)

REFERENCE:	Deposit J-70 A and J-71, Area VII and Deposit I-34 DIAND Granular Resource Inventory; Camsell Bend NTS 95J and Bulmer Lake NTS 95I, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel and sand;
RESERVES: Possible	75,000 cu.m (100,000 cu.yd.)
SITE DESCRIPTION:	A series of esker ridges located approximately 26 km (16 mi.) southeast of Highland Lake. Thickness: 9 m (30 ft.) Area: 230,000 sq m (2,500,000 sq ft.) Perimeter: 26,000 m (84,000 ft.) Map Reference: NTS 95J, Camsell Bend and NTS 95-I, Bulmer Lake UTM Reference: Zone 10; 552,000E 7,945,000N
ASSESSMENT:	Suitable for development. The source is located outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat terrain. The Willowlake River will probably have to be crossed to gain access to the pipeline route.

SITE BD14-04(3)

REFERENCE:	Deposit J-72, Area VII DIAND Granular Resource Inventory, Camsell Bend NTS 95J, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel and sand;
RESERVES: Possible	50,000 cu.m (65,000 cu.yd.)
SITE DESCRIPTION:	A series of esker ridges located approximately 24 km (15 mi.) SSE of Highland Lake.
	Thickness: 15 m (50 ft.) Area: 190,000 sq m (2,000,000 sq ft.) Perimeter: 10,000 m (35,000 ft.)
	Map Reference: NTS 95J, Camsell Bend
	UTM Reference: Zone 10; 498,000E 6,937,000N
ASSESSMENT:	Suitable for development.
	The source is located within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat to gently sloping terrain.

SITE BD14-05(3)

REFERENCE:	Deposit I-23, I-24, I-25, DIAND Granular Resource Inventory, Bulmer Lake NTS 95-I, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Sand and gravel, little silt;
RESERVES: Possible	100,000,000 cu.m (135,000,000 cu.yd.)
SITE DESCRIPTION:	Alluvial flood plain and adjacent low terraces of the upstream portion of Willowlake River.
	Thickness: 9 m (30 ft.) Area: 3,300,000 sq m (36,000,000 sq. ft.) Perimeter: 108,000 m (350,000 ft.)
	Map Reference: NTS 95-I, Bulmer Lake.
	UTM Reference: Zone 10; 560,000E 6,930,000N
ASSESSMENT:	Not suitable for development because all available granular materials are within or immediately adjacent to the active stream channel of the Willowlake River.
	The source lies entirely outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter over flat, thermokarst terrain.

SITE BD14-06(NG)

REFERENCE:	Site 123X, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class NG, Non-granular material not suitable for construction purposes.
MATERIAL DESCRIPTION:	Silt, sand and clay with some pebbles (glacial till) (ML-CL).
SITE DESCRIPTION:	Ground moraine which has been surficially reworked during the development of drainage patterns; located approximately 27 km (17 mi.) south of Willowlake River.
	Vegetation: moderate growths of spruce, pine and birch.
	Drainage: good to the west.
	Map Reference: NTS 95J, Camsell Bend
	UTM Reference: Zone 10; 505,800E 6,926,600N
SITE INVESTIGATION:	6 drill holes.
ASSESSMENT:	Material is not suitable for construction purposes.

SITE BD14-07(2)

REFERENCE:		Site 124, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:		Class 2, Good quality material suitable for embankment fill, base and surface course aggregates.
MATERIAL DESCRIPTION:		Sand and gravel, trace silt, variable gradation, stratified (SW-GW); Maximum size to 20 cm (8 in.).
OVERBURDEN:		Topsoil and silt; 30 cm (1 ft.) to 180 (6 ft.)
DEPTH OF ACTIVE LAYER:		Not determined.
RESERVES:	Proven	250,000 cu.m (350,000 cu.yd.)
	Probable	2,500,000 cu.m (3,500,000 cu.yd.)
	Possible	8,000,000 cu.m (10,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:		
METHOD OF EXTRACTION:		Rip and doze. Buffer zones should be maintained between the borrow pit work areas.
SITE DESCRIPTION:		Extensive esker field located approximately 30 km (19 mi.) south of the Willowlake River. Vegetation: moderately dense spruce, birch, poplar and pine. Drainage: good to the west. Thickness: 4.5 m (15 ft.) Area: 3,500,000 sq.m (37,000,000 sq.ft.) Perimeter: 34,000 m (110,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 505,800E 6,926,600N
SITE INVESTIGATION:		15 drill holes, 1 test pit.
ASSESSMENT:		Suitable for development. Selective excavation and additional screening, crushing and washing of the material may produce quality aggregates. Additional laboratory tests to evaluate specific properties will be required, if the material is to be considered for production of concrete aggregates.

SITE BD14-07(2)

The source lies outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across poorly to fairly drained flat terrain.

SITE BD14-08(4)

REFERENCE:	Site 117, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Sand, some gravel and silt (SM-GM).
OVERBURDEN:	Topsoil, variable depth
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Possible	Not determined.
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	Widely scattered crevasse fillings located along the northern periphery of Ebbutt Hills. Vegetation: sparse growths of black spruce. Drainage: fair. Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 506,200E 6,992,700N
SITE INVESTIGATION:	None.
ASSESSMENT:	Not suitable for development because large surface areas must be cleared compared to the relatively small volume of recoverable material. The sources lies outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter is very difficult across gently sloping terrain incised by shallow meandering creek channels.

SITE BD14-09(NG)

REFERENCE:	Site 116X, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class NG, Non-granular material unsuitable for construction purposes.
MATERIAL DESCRIPTION:	Clay, silty, some sand and gravel (glacial till) (CI); Medium moisture content.
SITE DESCRIPTION:	Segments of "De Geer" and terminal moraines located approximately 40 km (25 mi.) south-east of the Willowlake River. Vegetation: moderately dense spruce and poplar. Drainage: good to the west. Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 514,400E 6,920,000N
SITE INVESTIGATION:	7 drill holes.
ASSESSMENT:	Material is not suitable for construction purposes.

SITE BD14-10(2)

REFERENCE:	Site 118, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 2, Good quality material suitable for embankment fill base and surface course aggregate.
MATERIAL DESCRIPTION:	Sand and gravel, variable gradation, trace silt, stratified (SW-GW); Maximum size to 11.4 cm (4½ in.); Medium to high moisture content.
OVERBURDEN:	Topsoil and silt; 30 cm to 90 cm (3 ft.)
DEPTH OF ACTIVE LAYER:	200 cm (8 ft.)+
RESERVES: Proven	80,000 cu.m (100,000 cu.yd.)
Probable	2,000,000 cu.m (2,500,000 cu.yd.)
Possible	2,500,000 cu.m (3,500,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze; selective excavation procedures be employed to maximize the recovery of better quality material.
SITE DESCRIPTION:	Numerous segmented esker ridges located approximately 34 km (21 mi.) south of Willowlake River. Vegetation: moderately dense growth of spruce, birch, poplar and pine. Drainage: good to the west. Thickness: 4 m (6 ft.) Area: 1,800,000 sq.m (20,000,000 sq.ft.) Perimeter: 15,000 m (50,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 505,100E 6,918,200N
SITE INVESTIGATION:	5 drill holes.
ASSESSMENT:	Suitable for development. The selective excavation and additional screening, crushing and washing of granular materials may produce concrete aggregates. Additional laboratory

tests to evaluate specific properties of the granular materials will be required, if the material is to be considered for the production of concrete aggregates.

The source lies outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across fairly to poorly drained terrain, incised by shallow meandering stream channels.

SITE BD14-11(R1)

REFERENCE:	Site 125, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class R-1, Bedrock suitable for manufacturing various construction aggregates.
MATERIAL DESCRIPTION:	Limestone interbedded with siltstone and shale.
OVERBURDEN:	Topsoil and silt.
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Possible	Unlimited.
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Quarry and blasting.
SITE DESCRIPTION:	Bedrock ridge covered with glaciolacustrine deposits, located approximately 19 km (12 mi.) northeast of Camsell Bend on the east side of the Mackenzie River. Drainage: fair to poor into adjacent terrain. Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 495,400E 6,918,700N
SITE INVESTIGATION:	None.
ASSESSMENT:	May be suitable for development but overburden thickness may curtail the exploitation of the site. The source lies outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat poorly drained and locally thermally sensitive terrain.

SITE BD14-12(4)

REFERENCE:	Site 119X, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for very marginal fill.
MATERIAL DESCRIPTION:	Sand, some silt, variable gradation (SM-SP); Medium moisture content.
OVERBURDEN:	Topsoil and peat; 30 cm (1 ft.)
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Proven	100,000 cu.m (150,000 cu.yd.)
Probable	750,000 cu.m (1,000,000 cu.yd.)
Possible	1,000,000 cu.m (1,500,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	Series of shallow, till ridges topped with outwash material, located approximately 35 km (22 mi.) southeast of Willowlake River. Vegetation: moderate growths of spruce, poplar and birch. Drainage: fair to southwest. Thickness: 3 m (10 ft.) Area: 660,000 sq.m (7,100,000 ft.) Perimeter: 9,800 m (32,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 505,100E 6,918,200N
SITE INVESTIGATION:	4 drill holes.
ASSESSMENT:	May be suitable for development as a source of very poor quality material although only shallow depths of sand are available. The source lies outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter over flat terrain braided by numerous dry stream channels.

SITE BD14-13(4)

REFERENCE:	Site 120, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Sand, silty and clayey.
OVERBURDEN:	Topsoil
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Possible	500,000 cu.m (650,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	Two till ridges located approximately 35 km (22 mi.) south of Willowlake River and 32 km (20 mi.) west of the Ebbutt Hills. Vegetation: moderate growths of spruce, birch and poplar. Drainage: fair into adjacent terrain. Thickness: 3 m (10 ft.) Area: 280,000 sq.m (3,000,000 sq.ft.) Perimeter: 3,200 m (11,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 503,100E 6,915,900N
SITE INVESTIGATION:	None.
ASSESSMENT:	May be suitable for development. The source lies well outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat terrain incised by numerous dry stream shallows.

SITE BD14-14(4)

REFERENCE:	Site 115X, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for very marginal fill.
MATERIAL DESCRIPTION:	Sand, some silt, some clay, fine grained (SM-SC); Maximum size #4 sieve.
OVERBURDEN:	Topsoil; 60 cm (1 ft.)
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Proven	250,000 cu.m (300,000 cu.yd.)
Probable	1,500,000 cu.m (2,000,000 cu.yd.)
Possible	2,500,000 cu.m (3,500,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	Two shallow esker-kame ridges and one kame hillock located approximately 42 km (26 mi.) southeast of Willowlake River. Vegetation: moderate growths of spruce, poplar and birch. Drainage: fair to the southwest. Thickness: 9 m (30 ft.) Area: 550,000 sq.m (5,900,000 sq.ft.) Perimeter: 8,700 m (29,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 511,800E 6,913,000N
SITE INVESTIGATION:	4 drill holes.
ASSESSMENT:	May be suitable for development as a very marginal fill if there is a scarcity of construction materials in the general area. Materials of granular quality were not established at this site during the field investigations. If site is exploited, then development procedures, compatible with the physical and biological frame-work of the site area, should be established in accordance with the land use regulations which are in effect at that time.

SITE BD14-14(4)

The source lies outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across slightly depressional, poorly drained terrain, incised by shallow meandering creek channel.

SITE BD14-15(NG)

REFERENCE:	Site 114, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class NG, Non-granular material unsuitable for construction purposes.
MATERIAL DESCRIPTION:	Sand, silt and clay (till); Variably worked at surface.
SITE DESCRIPTION:	Four hummocks of partly reworked glacial till located west of the Ebbutt Hills. Vegetation: dense stands of spruce, poplar and birch. Drainage: fair into adjacent terrain. Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 520,000E 6,892,700N
SITE INVESTIGATION:	None.
ASSESSMENT:	Material is not suitable for construction purposes.

SITE BD14-16(NG)

REFERENCE:	Site 113X, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class NG, Non-granular material unsuitable for construction purposes.
MATERIAL DESCRIPTION:	Sand, some silt, little gravel, medium to coarse, (till like) (SM-ML); Maximum size greater than 7.8 cm (3 in.); Low moisture content.
SITE DESCRIPTION:	Scattered and shallow glaciofluvial outwash deposits overlying glacial till, located approximately 18 km (11 mi.) north of Trail River. Vegetation: moderately dense spruce and poplar. Drainage: good to the south. Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 534,100E 6,903,500N
SITE INVESTIGATION:	4 drill holes.
ASSESSMENT:	Not suitable for construction purposes.

SITE BD14-17(4)

REFERENCE:	Site 112, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Sand, silty; Localized till pockets.
OVERBURDEN:	Topsoil and silt
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Possible	7,000,000 cu.m (9,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	Glaciofluvial outwash deposit farming a pitted, longitudinal field located between the southern reaches of the Ebbutt Hills and the north bank of the Mackenzie River. Drainage: fair to good into adjacent stream channel. Thickness: 6 m (20 ft.) Area: 1,400,000 sq.m (15,000 sq.ft.) Perimeter: 8,900 m (24,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 534,600E 6,900,700N
SITE INVESTIGATION:	None.
ASSESSMENT:	May be suitable for development as a source of very marginal fill. The source is located adjacent to the western border of the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, poorly drained and thermally sensitive terrain.

SITE BD14-18(4)

REFERENCE:	Site 106, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for very marginal fill.
MATERIAL DESCRIPTION:	Sand, fine grained (SP).
OVERBURDEN:	Topsoil
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Possible	20,000,000 cu.m (30,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	Longitudinally shaped area covered with wind-blown sands, located about 3 km (2 mi.) northwest of Trail River and approximately 5 km (3 mi.) north of the Mackenzie River channel. Vegetation: birch, poplar and spruce. Drainage: fair into adjacent terrain. Thickness: 4.5 m (15 ft.) Area: 4,700,000 sq.m (50,000,000 sq.ft.) Perimeter: 12,000 m (40,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 540,000E 6,891,100N
SITE INVESTIGATION:	None.
ASSESSMENT:	May be suitable for development although material is of very poor quality. The source lies well outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, poorly drained muskeg terrain which is thermally sensitive.

SITE BD14-19(4)

REFERENCE:	Site 105, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Sand, fine grained (SP).
OVERBURDEN:	Topsoil, variable depth
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Possible	30,000,000 cu.m (40,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	Large sand dune complex paralleling the north bank of the Mackenzie River at a distance of 2½ km (1½ mi.) and located approximately 50 km (30 mi.) downstream of Fort Simpson. Drainage: fair into adjacent terrain. Thickness: 7.5 m (25 ft.) Area: 8,000,000 sq.m (86,000,000 sq.ft.) Perimeter: 26,000 m (84,000 ft.) Map Reference: NTS 95J, Camsell Bend UTM Reference: Zone 10; 550,000E 6,886,300N
SITE INVESTIGATION:	None.
ASSESSMENT:	May be suitable for development. The source lies outside the 28km (17.5 mi.) pipeline corridor. Access is by truck in the winter across poorly drained and thermally sensitive terrain. Small stream crossings will be required for access.

SITE BD14-20(NG)

REFERENCE:	Site 107X, Fort Simspon to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class NG, Non-granular material unsuitable for construction purposes.
MATERIAL DESCRIPTION:	Sand, trace silt, fine grained, poorly graded (SP-SM); Maximum size #4 sieve; Low moisture content.
DEPTH OF ACTIVE LAYER:	180 cm (6 ft.)
SITE DESCRIPTION:	High fluvial terrace located on the north bank of the Mackenzie River.
	Drainage: good to the south.
	Map Reference: NTS 95J, Camsell Bend
	UTM Reference: Zone 10; 538,600E 6,886,800N
SITE INVESTIGATION:	1 test pit.
ASSESSMENT:	Material is not suitable for construction purposes.

SITE BD14-21(3)

REFERENCE:	Deposit J-75, J-76, J-166, J-167, Area VIII DIAND Granular Resource Inventory, Camsell Bend NTS 95J, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Sand, gravel and silt;
RESERVES: Possible	75,000,000 cu.m (100,000,000 cu.yd.)
SITE DESCRIPTION:	Alluvial terraces along the east bank of the Mackenzie River opposite the confluence of the Trail and Mackenzie Rivers.
	Thickness: 12 m (40 ft.) Area: 49,000,000 sq m (530,000,000 sq ft.) Perimeter: 53,000 m (175,000 ft.)
	Map Reference: NTS 95J, Camsell Bend
	UTM Reference: Zone 10; 540,000E 6,880,000N
ASSESSMENT:	Suitable for development on a limited scale in areas away from the main channel of the Mackenzie River.
	The source is located well outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter over flat thermokarst terrain. Access includes crossing the Mackenzie River either by truck in the winter or by barge in the summer. A barging operation may require stockpiling because of seasonal land access.

SITE BD14-22(NG)

REFERENCE:	Site 108X, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class NG, Non-granular material unsuitable for construction purposes.
MATERIAL DESCRIPTION:	Silt, clay and sand with little gravel (MH-ML); Maximum size to 25 cm (10 in.).
DEPTH OF ACTIVE LAYER:	105 cm (3.5 ft.)
SITE DESCRIPTION:	Alluvial river terrace located on the south bank of the Mackenzie River.
	Vegetation: moderately dense growths of birch and poplar interspersed with spruce.
	Drainage: good to the north.
	Map Reference: NTS 95J, Camsell Bend
	UTM Reference: Zone 10; 540,000E 6,883,100N
SITE INVESTIGATION:	1 test pit.
ASSESSMENT:	Material is not suitable for construction purposes.

SITE BD14-23(4)

REFERENCE:	Site 104X, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for very marginal fill.
MATERIAL DESCRIPTION:	Sand, fine grained, poorly graded, eolian (SP); Low to medium moisture content.
OVERBURDEN:	Peat and topsoil; 0 to 60 cm (2 ft.)
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Proven	30,000 cu.m (40,000 cu.yd.)
Probable	3,000,000 cu.m (4,000,000 cu.yd.)
Possible	4,000,000 cu.m (5,500,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	A large field of sand dunes of various sizes located on the north bank of the Mackenzie River. Vegetation: moderate growths of spruce. Drainage: poorly drained to southwest, well drained to northwest. Thickness: 7.5 m (25 ft.) Area: 1,100,000 sq.m (12,000,000 sq.ft.) Perimeter: 12,000 m (39,000 ft.) Map Reference: NTS 95I, Bulmer Lake UTM Reference: Zone 10; 557,500E 6,881,800N
SITE INVESTIGATION:	4 drill holes.
ASSESSMENT:	May be suitable for development although material is of very poor quality. The source lies outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter over flat, poorly drained, muskeg terrain which exhibits high thermal sensitivity.

SITE BD14-24(4)

REFERENCE:	Site 102, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Gravel, sandy; May exist as scattered pockets or layer.
OVERBURDEN:	Topsoil and silt; variable depth
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Possible	8,500,000 cu.m (11,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	High, cresent shaped terrace located on the north side of the Mackenzie River and approximately 22 km (14 mi.) downstream from Fort Simpson. Vegetation: densely wooded with good stands of spruce, birch and poplar. Drainage: good to the south. Thickness: 3 m (10 ft.) Area: 1,900,000 sq.m (20,000,000 sq.ft.) Perimeter: 6,900 m (23,000 ft.) Map Reference: NTS 95-I, Bulmer Lake UTM Reference: Zone 10; 562,500E 6,875,500N
SITE INVESTIGATION:	None.
ASSESSMENT:	May be suitable for development. The source lies outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat slightly depressional and poorly drained terrain and may involve at least one stream crossing. The adjacent Mackenzie River provides good access to the site by water transportation.

SITE BD14-25(2)

REFERENCE:	Site 103X, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 2, Good quality material suitable for embankment fill, base and surface course aggregate.
MATERIAL DESCRIPTION:	Gravel, medium grained, well graded, trace silt (GW); Maximum size to 7.8 (3 in.).
OVERBURDEN:	Silt and topsoil; 45 cm (1½ ft.)+
DEPTH OF ACTIVE LAYER:	Not determined.
RESERVES: Possible	1,500,000 cu.m (2,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze with possible dredging. Only dry bars and other areas removed from the stream channel should be developed. Borrow areas should be geographically flexible within the site in order to allow for periodic shifting of the stream channel. Excavation should not occur more than 60 cm (2 ft.) to 90 cm (3 ft.) below the ground water table. In such cases, wet materials should remain isolated from the active stream channels. Buffer zones and settling ponds that separate the working areas from the active stream channel should be maintained.
SITE DESCRIPTION:	Alluvial flood plain and terraces within the active stream channel of the Martin River. Drainage: into adjacent stream. Thickness: 1.5 m (5 ft.) Area: 870,000 sq.m (9,400,000 sq.ft.) Perimeter: 10,000 m (34,000 ft.) Map Reference: NTS 95H, Fort Simpson UTM Reference: Zone 10; 556,500E 6,873,700N
SITE INVESTIGATION:	1 bank exposure.
ASSESSMENT:	Not suitable for development because the gravel

deposits are loacted within the active stream channel of the Martin River and exhibits high environmental sensitivities.

The source lies well outside the 28 km (17.5 mi.) pipeline corridor.

SITE BD15-01(3)

REFERENCE:	Site 101, Fort Simpson to Wrigley, Intercommunity Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel, some sand, trace silt, coarse grained (GW-GP); Maximum size 3.8 cm (1.5 in.); Medium moisture content.
OVERBURDEN:	Topsoil, peat and silt; 180 cm (6 ft.)+
DEPTH OF ACTIVE LAYER:	120 cm (4 ft.)+
RESERVES: Proven	15,000 cu.m (20,000 cu.yd.)
Probable	1,500,000 cu.m (2,000,000 cu.yd.)
Possible	7,000,000 cu.m (9,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	High fluvial terrace containing remnants of glaciofluvial deposits, located approximately 19 km (12 mi.) downstream from Fort Simpson. Vegetation: densely wooded with stands of spruce, birch and poplar. Drainage: fair to the south Thickness: 1.5 m (5 ft.) Area: 4,600,000 sq m (49,000,000 sq ft.) Perimeter: 16,000 m (51,000 ft.) Map Reference: NTS 95H, Fort Simpson UTM Reference: Zone 10; 566,700E 6,874,100N
SITE INVESTIGATION:	5 drill holes, 2 test pits.
ASSESSMENT:	May be suitable for development subject to the findings of a more detailed site investigation program, then development procedures, compatible with existing land use regulations should be employed. Results of site investigation to date show a predominance of stratified gravelly sands,

silts and clays exhibiting a"washed till-like" texture. However, it is considered likely that isolated pockets of fair quality granular material occur with the site.

The source lies outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across gently rolling terrain pitted with muskeg bogs. Access along the adjacent Mackenzie River is possible by barge in the summer.

SITE BD15-02(3)

REFERENCE:	Deposit (H-42), DIAND Granular Resource Inventory; Fort Simpson NTS 95H, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Sand and gravel.
RESERVES: Possible	45,000 cu.m (60,000 cu.yd.)
SITE DESCRIPTION:	Low esker ridge located approximately 24 km (15 mi.) northeast of Fort Simpson.
	Perimeter: 11,000 m (37,000 ft.)
	Map Reference: NTS 95H, Fort Simspon
	UTM Reference: Zone 10; 607,500E 6,875,000N
ASSESSMENT:	Suitable for development.
	The source is located within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, thermokarst terrain.

SITE BD15-03(3)

REFERENCE:	Deposit (H-40 , H-41), DIAND Granular Resource Inventory; Fort Simpson NTS 95H, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Sand and gravel.
RESERVES: Possible	70,000 cu.m (90,000 cu.yd.)
SITE DESCRIPTION:	Two low esker ridges located approximately 32 km (20 mi.) ENE of Fort Simpson.
	Perimeter: 11,000 m (37,000 ft.)
	Map Reference: NTS 95H, Fort Simpson
	UTM Reference: Zone 10; 619,000E 6,867,500N
ASSESSMENT:	Suitable for development.
	The source is located adjacent to the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter over flat thermally sensitive terrain.

SITE BD15-04(2)

REFERENCE:	Site FS13, Fort Simpson Community Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 2, Good quality material suitable for embankment fill, base and surface course aggregates.
MATERIAL DESCRIPTION:	Gravel, little sand, trace silt, medium grained GW-GM); Maximum size greater than 20 cm (8 in.); Medium to high moisture content; Groundwater table varying between 1 m (3 ft.) and 3.5 m (11 ft.) below existing ground surface.
OVERBURDEN:	Topsoil, peat, silt; 90 cm (3 ft.)+
DEPTH OF ACTIVE LAYER:	Variable
RESERVES: Proven	250,000 cu.m 350,000 cu.yd.)
Probable	2,500,000 cu.m (3,500,000 cu.yd.)
Possible	4,000,000 cu.m (5,500,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze. In view of the relatively high ground water table, predraining of borrow pit areas may have to be considered during various stages of development. It is suggested that the borrow pit is opened at the southern extremity of the gravel pocket, located in the southern portion of the site, and work gradually northward. This will facilitate draining of the area into the Mackenzie River system.
SITE DESCRIPTION:	Morainal deposit which is dominantly glacial till with large isolated pockets of granular material, located 4 km (2.5 mi.) north of Fort Simpson and about 1 km (½ mi.) inland from north bank of the Mackenzie River. Vegetation: spruce, birch and poplar. Drainage: generally fair to the south except poor in the eastern portion of the site. Thickness: 2 m (6.5 ft.) Area: 2,200,000 sq m (23,000,000 sq ft.) Perimeter: 17,000 m (55,000 ft.)

SITE BD15-04(2)

Map Reference: NTS 95H, Fort Simpson

UTM Reference: Zone 10; 582,300E 6,856,500N

SITE INVESTIGATION: 10 drill holes.

ASSESSMENT: Suitable for development as a source of general backfill, road bases, base course aggregates and building pads. Furthermore, the gravels from the gravel pocket, located in the south-eastern portion of the site, can be considered for concrete aggregate if proper crushing, screening and washing operations are implemented.

The source is located adjacent to the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across rolling to hummocky poorly drained terrain. An existing"winter road" passes through the center of the large gravel deposit and provides prime access for overall development of borrow pit areas at this site.

SITE BD15-05(3)

REFERENCE:	Site FS12, Fort Simpson Community Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel, coarse sand (SW-GW); Maximum size greater than 7.8 cm (3 in.); Medium moisture content.
OVERBURDEN:	Topsoil and silt 30 cm (1 ft.) to 335 cm (11 ft.)
DEPTH OF ACTIVE LAYER:	60 cm (2 ft.)+
RESERVES: Proven	40,000 cu.m (55,000 cu.yd.)
Probable	4,000,000 cu.m (5,500,000 cu.yd.)
Possible	15,000,000 cu.m (20,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	Glaciofluvial outwash material located approximately 3 km (2 mi.) north of Fort Simpson along the north banks of the Mackenzie River. Vegetation: densely wooded with stands of spruce birch and poplar. Drainage: good to the south Thickness: 3.5 m (12 ft.) Area: 14,000,000 sq m (150,000,000 sq ft.) Perimeter: 29,000 m (96,000 ft.) Map Reference: NTS 95H, Fort Simpson UTM Reference: Zone 10; 580,000E 6,856,200N
SITE INVESTIGATION:	9 drill holes, 1 test pit.
ASSESSMENT:	Isolated larger pockets of sandy, coarse gravel suitable for fair to good quality general fill may be irregularly scattered throughout the site and should be selectively exploited. The source may be suitable for development, subject to the findings of a more detailed site investigation program, then operating procedures which would

be compatible with existing land use regulations would have to be employed in the development of borrow pit areas.

The source is located adjacent to the western border of the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across rolling to hummocky, poorly drained terrain. The adjacent Mackenzie River is accessible by barge in the summer.

SITE BD15-06(4)

REFERENCE:	Site FS7X, Fort Simpson Community Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for very marginal fill.
MATERIAL DESCRIPTION:	Sand, fine, trace of silt (SP).
OVERBURDEN:	Topsoil; 30 cm (1 ft.)
DEPTH OF ACTIVE LAYER:	150 cm (5 ft.)
RESERVES: Proven	10,000 cu. m (15,000 cu.yd.)
Probable	1,000,000 cu.m (1,500,000 cu.yd.)
Possible	4,000,000 cu.m (5,500,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	Large group of wind blown sand dunes located approximately 17 km (11 mi.) west of Fort Simpson.
	Vegetation: poplar, birch and spruce.
	Drainage: good into adjacent terrain
	Thickness: 4.5 m (15 ft.) Area: 1,800,000 sq m (19,000,000 sq ft.) Perimeter: 10,000 m (33,000 ft.)
	Map Reference: NTS 95H, Fort Simpson
	UTM Reference: Zone 10; 569,100E 6,865,000N
SITE INVESTIGATION:	1 test pit.
ASSESSMENT:	Suitable for development as a source of very marginal fill. However, the borrow pit developed in these dune complexes would be very sensitive to wind and water erosion.
	The source lies outside the 28 km (17.5 mi.) pipeline corridor. Access involves crossing the Mackenzie River either by truck in the winter or by barge in the summer.

SITE BD15-07(3)

REFERENCE:	Deposit (H-62, H-64), Area III, DIAND Granular Resource Inventory; Fort Simpson NTS 95H, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Silt and gravel.
RESERVES: Possible	10,000,000 cu.m (15,000,000 cu.yd.)
SITE DESCRIPTION:	Alluvial floodplain and adjacent low terraces of the Martin River. Thickness: 6 m (20 ft.) Area: 16,000,000 sq.m (170,000,000 sq.ft.) Perimeter: 44,000 m (145,000 ft.) Map Reference: NTS 95H, Fort Simpson UTM Reference: Zone 10; 570,000E 6,860,000N
ASSESSMENT:	Not suitable for development because all available granular materials are within or immediately adjacent to the active stream channel of the Martin River. The source is located outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, thermokarst terrain. Access will include crossing the Mackenzie or Liard River by either truck in the winter or barge in the summer. A barging operation may require stockpiling because of seasonal land access.

SITE BD15-08(4)

REFERENCE:	Site FS8, Fort Simpson Community Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for very marginal fill.
MATERIAL DESCRIPTION:	Sand, fine (SP).
OVERBURDEN:	Topsoil 15 cm (½ ft.)
DEPTH OF ACTIVE LAYER:	180 cm (6 ft)
RESERVES: Proven	25,000 cu.m (30,000 cu.yd.)
Probable	4,500,000 cu.m (6,000,000 cu.yd.)
Possible	2,500,000 cu.m (30,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze. Vertical excavation should be considered to minimize erosion.
SITE DESCRIPTION:	Large complex of sand dunes which covers about two square miles of the terrain paralleling the Martin River, located 13 km (8 mi.) west of Fort Simpson. Vegetation: dense growths of spruce and poplar with some birch. Drainage: good Thickness: 15 m (50 ft.) Area: 2,000,000 sq m (20,000,000 sq ft.) Perimeter: 15,000 m (50,000 ft.) Map Reference: NTS 95H, Fort Simpson UTM Reference: Zone 10; 574,500E 6,860,000N
SITE INVESTIGATION:	1 test pit
ASSESSMENT:	Suitable for development. The consultants report recommends that the material from the source be used in construction of local utilities. The source lies outside the 28 km (17.5 mi.) pipeline corridor. Access involves crossing the Mackenzie River by barge in the summer and

by truck in the winter.

Similar quality materials are available on the east side of the Mackenzie River.

SITE BD15-09(4)

REFERENCE:	Site FS-3, Fort Simpson Community Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Sand, very fine, little silt (SP).
OVERBURDEN:	Topsoil; 30 cm (1 ft)
DEPTH OF ACTIVE LAYER:	150 cm (5 ft.)
RESERVES: Proven	100,000 cu.m (150,000 cu. yd.)
Probable	1,000,000 cu.m (1,500,000 cu. yd.)
Possible	35,000,000 cu.m (50,000,000 cu. yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze. The development of borrow pit areas should be restricted to the more pronounced and well developed sand dunes. Vertical excavation should be considered to minimize erosion. Vegetation buffer zones should be maintained between work areas to minimize erosion.
SITE DESCRIPTION:	Flat, glaciolacustrine plain which has been reworked by wind action, located approximately 2.5 km (1.5 mi.) southwest of Fort Simpson. Numerous small sand dunes are prevalent over the site area. Vegetation: dense growths of spruce, poplar and birch. Drainage: good Thickness: 3 m (10 ft.) Area: 12,000,000 sq m (125,000,000 sq ft.) Perimeter: 27,000 m (90,000 ft.) Map Reference: NTS 95H, Fort Simpson UTM Reference: Zone 10; 584,000E 6,859,000N
SITE INVESTIGATION:	2 test pits.
ASSESSMENT:	Suitable for development. The consultants report recommends that borrow material should be re-

stricted for use in construction of local utilities.

The source is located adjacent to the western border of the 28 km (17.5 mi.) pipeline corridor. Access to the pipeline involves crossing the Mackenzie River either by barge in the summer or by truck in the winter. The barging operation may require stockpiling because of seasonal land access. Access on the east bank of the Mackenzie River is by truck in the winter across rolling to hummocky, poorly drained terrain.

SITE BD15-10(4)

REFERENCE:	Site FS4X, Fort Simpson Community Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for very marginal fill.
MATERIAL DESCRIPTION:	Sand, fine grained, some silt (SP).
OVERBURDEN:	Topsoil, 15 cm (½ ft.) to 60 cm (2 ft.)
DEPTH OF ACTIVE LAYER:	90 cm (3 ft.)+
RESERVES: Proven	2,000,000 cu.m (3,000,000 cu.yd.)
Probable	10,000,000 cu.m (15,000,000 cu.yd.)
Possible	15,000,000 cu.m (20,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	A narrow strip of glaciolacustrine silts and sands located approximately 1 km (½ mi.) south-east of Fort Simpson along the west bank of the Liard River.
	Vegetation: dense growths of spruce, birch and poplar to 20 cm (70 ft.).
	Drainage: good
	Thickness: 9 m (30 ft.) Area: 1,800,000 sq m (19,000,000 sq ft.) Perimeter: 8,000 m (26,000 ft.)
	Map Reference: NTS 95H, Fort Simpson
	UTM Reference: Zone 10; 587,900E 6,857,200N
SITE INVESTIGATION:	2 test pits.
ASSESSMENT:	Not suitable for development because the available material is a fine, silty sand which is generally susceptible to frost action.
	The current development of trailer park facilities, negates further development of borrow pits, since it would appear that this site area is being designated for future expansion of the

SITE BD15-10(4)

Fort Simpson townsite.

The source is located adjacent to the western border of the 28 km (17.5 mi.) pipeline corridor. An all weather highway to the Fort Simpson airport traverses the entire site area. Access to the pipeline would require crossing the Liard River by either barge in the summer or truck in the winter. Similar, poor quality material is available on the east side of the Mackenzie River.

The source was previously developed during the construction of the existing highway. Three borrow pits from 3 m (10 ft.) to 7.5 m (25ft.) deep exist within the source area.

SITE BD15-11(2)

REFERENCE:	Site FS1, Fort Simpson, Community Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 2, Good quality material suitable for embankment fill, base and surface course aggregate.
MATERIAL DESCRIPTION;	Gravel, some sand, medium grained (SW-GW); Maximum size to 3.9 cm (1.5 in.); Low moisture content.
OVERBURDEN:	Topsoil and silt; 900 cm (30 ft.)+
DEPTH OF ACTIVE LAYER:	105 cm (3.5 ft.)
RESERVES: Proven	150,000 cu.m (200,000 cu.yd.)
Probable	1,500,000 cu.m (2,000,000 cu.yd.)
Possible	8,000,000 cu.m (10,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze. In order to decrease siltation, dozing of the sandy silt overburden over the west bank of the Liard River should be restricted. Relative to the granular deposits in the site immediately adjacent to the Liard River, consideration should be given to the development of new borrow areas further removed from the water course. A vegetation buffer zone of adequate dimensions should be maintained between the river and the working area of the borrow pit. The excessive depth of overburden may restrict the lateral expansion of the existing borrow pit area. The silty and sandy overburden removed from the pit should be wasted above the high water mark. Selection of equipment required will be governed by ground ice content at deeper extremities of this source.
SITE DESCRIPTION:	Two alluvial terrace segments on the west bank of the Liard River, located approximately 5 km (3 mi.) southeast of Fort Simpson.
	Vegetation: dense growths of spruce and poplar.
	Drainage: good to the souteast
	Thickness: 3 m (10 ft.)

SITE BD15-11(2)

Area: 3,000,000 sq m (33,000,000 sq ft.)
Perimeter: 11,000 m (36,000 ft.)

Map Reference: NTS 95H, Fort Simpson

UTM Reference: Zone 10; 590,700E 6,853,300N

SITE INVESTIGATION: 4 drill holes, 2 test pits.

ASSESSMENT: Suitable for continued development although the depth of overburden is quite considerable and may increase outside the existing borrow pit which may adversely affect the economics of the borrowing.

The source is located adjacent to the western border of the 28 km (17.5 mi.) pipeline corridor. An existing haul road provides access from the operating borrow pit to the all weather road which flanks the western extremity of the site area at a distance of approximately ½ km (¼ mi.). Access to the pipeline will involve the crossing of the Liard and possibly the Mackenzie Rivers. Barging along the Liard and Mackenzie River is possible in the summer but may require stockpiling because of seasonal land access. The major river crossings are also possible by truck in the winter. Access to the east bank of the Mackenzie River is by truck in the winter across rolling to hummocky, poorly drained terrain.

SITE BD15-12(4)

REFERENCE:	Site FS5X, Fort Simpson Community Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for very marginal fill.
MATERIAL DESCRIPTION:	Sand, fine grained, silt (SP); High moisture content.
OVERBURDEN:	Topsoil, 15 cm (½ ft.) to 45 cm (1.5 ft.)
DEPTH OF ACTIVE LAYER:	90 cm (3 ft.)+
RESERVES: Proven	600,000 cu.m (800,000 cu.yd.)
Probable	10,000,000 cu.m (15,000,000 cu.yd.)
Possible	40,000,000 cu.m (50,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	Glaciolacustrine plain extending south from site BD15-10(4), located 3 km (2 mi.) south of Fort Simpson. Vegetation: dense growth of spruce, birch and poplar to 20 cm (70 ft.) Drainage: good Thickness: 6 m (20 ft.) Area: 6,300,000 sq m (67,000,000 sq ft.) Perimeter: 15,000 m (49,000 ft.) Map Reference: NTS 95H, Fort Simpson UTM Reference: Zone 10; 588,900E 6,852,800N
SITE INVESTIGATION:	3 test pits.
ASSESSMENT:	Not suitable for development because the available material is a fine silty sand which is, generally susceptible to frost action and is not normally considered as a granular type material. The source is located adjacent to the western border of the 28 km (17.5 mi.) pipeline corridor.

SITE BD15-12(4)

An all weather highway to Fort Simpson airport passes through the western extremity of the site.

Access to the proposed pipeline route involves the crossing of the Liard and Mackenzie Rivers.

Four abondoned borrow pits have been developed along the east and west sides of the highway during construction.

SITE BD15-13(4)

REFERENCE:	Site FS11, Fort Simpson Community Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for very marginal fill.
MATERIAL DESCRIPTION:	Sand and silt, fine grained, some pockets of gravel (SM-ML).
OVERBURDEN:	Topsoil; 45 cm (1.5 ft.)
DEPTH OF ACTIVE LAYER:	Not determined
RESERVES: Proven	400,000 cu.m (500,000 cu.yd.)
Probable	4,000,000 cu.m (5,000,000 cu.yd.)
Possible	4,000,000 cu.m (5,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze.
SITE DESCRIPTION:	Large alluvial terrace formed between the Mackenzie and Liard Rivers, located approximately 8 km (5 mi.) southeast of Fort Simpson on the east bank of the Liard River.
	Vegetation: dense growths of birch and poplar with occasional spruce.
	Drainage: fair to the south
	Thickness: 3 m (10 ft.) Area: 1,300,000 sq m (14,000,000 sq ft.) Perimeter: 8,500 m (28,000 ft.)
	Map Reference: NTS 95H, Fort Simpson
	UTM Reference: Zone 10; 593,300E 6,852,300N
SITE INVESTIGATION:	2 test pits, 1 slope exposure.
ASSESSMENT:	Suitable for development. The source is located adjacent to the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across sloping well drained terrain.

SITE BD15-14(4)

REFERENCE:	Deposit (H-159), DIAND Granular Resouce Inventory; Fort Simpson NTS 95H, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Sand and silt.
RESERVES: Possible	5,500,000 cu.m (7,500,000 cu.yd.)
SITE DESCRIPTION:	Alluvial terrace adjacent to the Rabbitskin River located approximately 8 km (5 mi.) east of its confluence with the Mackenzie River.
	Thickness: 12 m (40 ft.) Area: 2,400,000 sq.m (26,000,000 sq.ft.) Perimeter: 9,800 m (32,000 ft.)
	Map Reference: NTS 95H, Fort Simpson
	UTM Reference: Zone 10; 632,000E 6,850,000N
ASSESSMENT:	Suitable for limited development with the portion of the source farthest removed from the active stream channel of the Rabbitskin River.
	The source is located outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat thermally sensitive terrain.

SITE BD15-15(NG)

REFERENCE:	Site FS6X, Fort Simpson Community Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class NG, Non-granular material not suitable for construction purposes.
MATERIAL DESCRIPTION:	Sand, fine grained, some silt, clay lenses (ML).
DEPTH OF ACTIVE LAYER:	150 cm (5 ft.)+
SITE DESCRIPTION:	Southern portion of the glaciofluvial plain which borders on the west bank of the Liard River, located approximately 10 km (6.5 mi.) southeast of Fort Simpson. The Fort Simpson airport is located immediately adjacent to the southern extremity of the site. Vegetation: dense growth of spruce, birch and poplar to 20 m (70 ft.) high. Drainage: fair to the west Map Reference: NTS 95H, Fort Simpson UTM Reference: Zone 10; 591,800E 6,851,000N
SITE INVESTIGATION:	2 test pits.
ASSESSMENT:	Material is not suitable for construction purposes.

SITE BD15-16(4)

REFERENCE:	Site FS10, Fort Simpson Community Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Sand, silty pockets of gravel at depth (SM-SP); Maximum size 1.9 cm (3/4 in.).
OVERBURDEN:	Topsoil and silt; 30 cm (1 ft) to 150 cm (5 ft.)
DEPTH OF ACTIVE LAYER:	60 cm (2 ft.)+
RESERVES: Proven	3,000,000 cu.m (4,000,000 cu.yd.)
Probable	15,000,000 cu.m (20,000,000 cu.yd.)
Possible	30,000,000 cu.m (40,000,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze. Surficial waste materials should not drain into the Liard River channel. Relative to development of borrow pits immediately adjacent to the Liard River, the development should be commenced furthest from the water course. A vegetation buffer zone should be maintained between the stream and the final limits of the borrow pit.
SITE DESCRIPTION:	Alluvial river terrace located approximately 16 km (10 mi.) southeast of Fort Simpson on the east side of the Liard River. Vegetation: growths of very dense bush and clustered stands of tall spruce, birch and poplar. Drainage: fair to the west. Thickness: 12 m (40 ft.) Area: 2,500,000 sq m (27,000,000 sq ft.) Perimeter: 9,600 m (32,000 ft.) Map Reference: NTS 95H, Fort Simpson UTM Reference: Zone 10; 595,500E
SITE INVESTIGATION:	7 drill holes.
ASSESSMENT:	Suitable for development. The consultants report recommends that the material be used for marginal

granular fill requirements in the construction of local utilities.

The source is located adjacent to the western border of the 28 km (17.5 mi.) pipeline corridor. The all weather highway to Fort Simpson traverses the northern half of the site. Access to the pipeline is across gently sloping terrain etched with numerous shallow stream channels.

SITE BD15-17(NG)

REFERENCE:	Site FS2X, Fort Simpson Community Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class NG, Non-granular material unsuitable for construction purposes.
MATERIAL DESCRIPTION:	Silt, some clay with little gravel (MH).
DEPTH OF ACTIVE LAYER:	60 cm (2 ft.)+
SITE DESCRIPTION:	An alluvial flood plain on the west bank of the Liard River, located approximately 14 km (9 mi.) southeast of Fort Simpson. An abandoned borrow pit is located at the northern tip of the site. Vegetation: dense growths of poplar, spruce and birch from 3 m (10 ft.) to 15 m (50 ft.) high. Drainage: good to the east. Map Reference: NTS 95H, Fort Simpson UTM Reference: Zone 10; 592,900E 6,846,100N
SITE INVESTIGATION:	1 slope exposure
ASSESSMENT:	Material is not suitable for construction purposes.

SITE BD15-18(4)

REFERENCE:	Deposit (H-76), Area III, DIAND Granular Resource Inventory; Fort Simpson NTS 95H, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Sand, medium to fine grained.
RESERVES: Possible	20,000,000 cu.m (25,000,000 cu.yd.)
SITE DESCRIPTION:	A series of sand dunes located approximately 16 km (10 mi.) southwest of Fort Simpson. Thickness: 10 m (33 ft.) Area: 8,000,000 sq.m (87,000,000 sq.ft.) Perimeter: 43,000 m (140,000 ft.) Map Reference: NTS 95H, Fort Simpson UTM Reference: Zone 10; 579,000E 6,843,000N
ASSESSMENT:	Suitable for developing dune areas as a source of marginal fill. Intervening flat areas may contain sand and gravel but are masked by organic cover, have high ice content and usually display high water table. The source is located outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat thermokarst terrain. Access includes crossing either the Liard or Mackenzie Riber by barge in the summer or truck in the winter. A barging operation may require stockpiling due to seasonal land access.

SITE BD15-19(2)

REFERENCE:	Site FS9, Fort Simpson Community Study Area, Stage I DIAND Granular Materials Inventory; PEMCAN Services "72", 1973.
MATERIAL QUALITY:	Class 2, Good quality material suitable for embankment fill, base and surface course aggregates.
MATERIAL DESCRIPTION:	Sand, medium to fine grained, large gravel pockets (SW-GW).
OVERBURDEN:	Topsoil and silt; 30 cm (1 ft.) to 90 cm (3 ft.)
DEPTH OF ACTIVE LAYER:	120 cm (4 ft.)+
RESERVES: Proven	70,000 cu.m (90,000 cu.yd.)
Probable	700,000 cu.m (900,000 cu.yd.)
Possible	2,500,000 cu.m (3,500,000 cu.yd.)
MINIMUM HAUL DISTANCE:	
METHOD OF EXTRACTION:	Rip and doze. Exploitation of additional granular materials may be undertaken by expanding the existing borrow pit. Surficial wastes should not drain in the Liard River channel. Disposal areas should be selected to minimize the drainage of waste material into the watershed of the Liard River. Vegetation buffer zones should be maintained between work areas to minimize erosion and instability.
SITE DESCRIPTION:	Cresent shaped beach ridge on the edge of a flat glaciolacustrine plain on the west banks of the Liard River, located approximately 18 km (11 mi.) directly south of Fort Simpson. Vegetation: moderately dense growth of poplar with the occasional spruce to 15 m (50 ft.) high. Drainage: good Thickness: 4.5 m (15 ft.) Area: 720,000 sq m (7,700,000 sq ft.) Perimeter: 4,300 m (14,000 ft.) Map Reference: NTS 95H, Fort Simpson UTM Reference: Zone 10; 587,100E 6,841,200N

SITE BD15-19(2)

SITE INVESTIGATION: 8 test pits

ASSESSMENT: Suitable for development. The consultants report recommends that the continued development of the source be used to augment the granular material requirements in the construction of local utilities.

The source is located well outside the 28 km (17.5 mi.) pipeline corridor. Access involves crossing the Liard River by barge in the summer or by truck in the winter.

SITE BD15-20(4)

REFERENCE:	Deposit (H-149), Area II, DIAND Granular Resource Inventory; Fort Simpson NTS 95H, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Sand, fine to medium grained.
RESERVES: Possible	2,500,000 cu.m (3,500,000 cu.yd.)
SITE DESCRIPTION:	Sand dunes and intervening flat areas located approximately 22 km (14 mi.) south of Fort Simpson. Thickness: 10 m (33 ft.) Area: 1,100,000 sq.m (12,000,000 sq.ft.) Perimeter: 13,000 m (42,000 ft.) Map Reference: NTS 95H, Fort Simpson UTM Reference: Zone 10; 590,000E 6,835,000N
ASSESSMENT:	Suitable for developing sand dunes as a source of marginal fill. Organic deposits, ground ice and high water table makes flat, inter-dune areas unsuitable for development. The source is located outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, thermokarst terrain.

SITE BD15-21(4)

REFERENCE:	Deposit (H-85, H-86), Area II; DIAND Granular Resource Inventory; Fort Simpson NTS 95H, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Sand, fine to medium grained.
RESERVES: Possible	10,000,000 cu.m (15,000,000 cu.yd.)
SITE DESCRIPTION:	Sand dunes on intervening flat areas located approximately 34 km (21 mi.) SSE of Fort Simpson.
	Thickness: 10 m (33 ft.) Area: 4,400,000 sq.m (47,000,000 sq.ft.) Perimeter: 14,000 m (47,000 ft.)
	Map Reference: NTS 95H, Fort Simpson
	UTM Reference: Zone 10; 598,000E 6,828,000N
ASSESSMENT:	Suitable for developing dune areas as a source of marginal fill. Organic deposits, ground ice and high water table makes inter-dune areas unsuitable for development.
	The source is located outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter over flat, thermokarst terrain.

SITE BD15-22(4)

REFERENCE:	Deposit (H-88, H-89), DIAND Granular Resource Inventory; Fort Simpson NTS 95H, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Sand, fine to medium grained.
RESERVES: Possible	50,000,000 cu.m (65,000,000 cu.yd.)
SITE DESCRIPTION:	Sand dunes and intervening flat areas located approximately 40 km (25 mi.) south of Fort Simpson.
	Thickness: 10.5 m (34 ft.) Area: 19,000,000 sq.m (210,000,000 sq.ft.) Perimeter: 40,000 m (130,000 ft.)
	Map Reference: NTS 95H, Fort Simpson
	UTM Reference: Zone 10; 595,000E 6,817,000N
ASSESSMENT:	Suitable for developing sand dunes as a source of marginal fill. Organic deposits, ground ice and high water table makes flat inter-dune areas unsuitable for development.
	The source is located outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, thermokarst terrain.

SITE BD15-23(4)

REFERENCE:	Deposit (H-134), Area II, DIAND Granular Resource Inventory; Fort Simpson NTS 95H, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Sand and silt.
RESERVES: Possible	2,000,000 cu.m (2,500,000 cu.yd.)
SITE DESCRIPTION:	Alluvial plain adjacent to the Jean-Marie River, located approximately 43 km (27 mi.) south of Fort Simpson.
	Thickness: 2.4 m (8 ft.) Area: 7,500,000 sq.m (81,000,000 sq.ft.) Perimeter: 20,000 m (65,000 ft.)
	Map Reference: NTS 95H, Fort Simpson
	UTM Reference: Zone 10; 680,000E 6,816,000N
ASSESSMENT:	Suitable for limited development of the portion of the source farthest removed from active stream channel.
	The source is located well outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter over flat thermokarst terrain.

SITE BD15-24(3)

REFERENCE:	Deposit (H-129, H-128), Area I, DIAND Granular Materials Inventory; Fort Simpson NTS 95H, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Sand and gravel.
RESERVES: Possible	100,000 cu.m (150,000 cu.yd.)
SITE DESCRIPTION:	Glaciolacustrine beach deposit immediately south of the Jean-Marie River and located approximately 48 km (30 mi.) south of Fort Simpson.
	Thickness: 3 m (10 ft.) Area: 68,000 sq.m (730,000 sq.ft.) Perimeter: 22,000 m (73,000 ft.)
	Map Reference: NTS 95H, Fort Simpson
	UTM Reference: Zone 10; 600,000E 6,815,000N
ASSESSMENT:	Suitable for development.
	The source is located outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, thermokarst terrain.

SITE BD15-25(4)

REFERENCE:	Deposit (H-90, H-91), Area I, DIAND Granular Resource Inventory; Fort Simpson NTS 95H, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Sand, medium to fine grained.
RESERVES: Possible	3,500,000 cu.m (4,500,000 cu.yd.)
SITE DESCRIPTION:	Sand dunes located just south of the Jean-Marie River and approximately 50 km (31 mi.) SSE of Fort Simpson.
	Thickness: 10 m (33 ft.) Area: 1,400,000 sq.m (15,000,000 sq.ft.) Perimeter: 9,500 m (31,000 ft.)
	Map Reference: NTS 95H, Fort Simpson
	UMT Reference: Zone 10; 604,000E 6,813,000N
ASSESSMENT:	Suitable for development.
	The source is located outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, thermokarst terrain.

SITE BD15-26(3)

REFERENCE:	Deposit (H-135), Area II, DIAND Granular Resource Inventory; Fort Simpson NTS 95H, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Sand and silt.
RESERVES: Possible	1,000,000 cu.m (1,500,000 cu.yd.)
SITE DESCRIPTION:	Alluvial plain adjacent to the Jean-Marie River, located approxiamtely 53 km (33 mi.) southeast of Fort Simpson.
	Thickness: 2.4 m (8 ft.) Area: 4,300,000 sq.m (47,000,000 sq.ft.) Perimeter: 15,000 m (50,000 ft.)
	Map Reference: NTS 95H, Fort Simpson
	UTM Reference: Zone 10; 619,000E 6,813,500
ASSESSMENT:	Suitable for development.
	The source is located adjacent to the western border of the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, thermokarst terrain.

SITE BD15-27(3)

REFERENCE:	Deposit (H-127), Area I, DIAND Granular Resource Inventory; Fort Simpson NTS 95H, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Sand and gravel.
RESERVES: Possible	100,000 cu.m (150,000 cu.yd.)
SITE DESCRIPTION:	Glaciolacustrine beach deposit south of the Jean-Marie River and located approximately 54 km (34 mi.) south of Fort Simpson.
	Thickness: 3 m (10 ft.) Area: 58,000 sq.m (620,000 sq.ft.) Perimeter: 19,000 m (62,000 ft.)
	Map Reference: NTS 95H, Fort Simpson
	UTM Reference: Zone 10; 613,000E 6,808,000N
ASSESSMENT:	Suitable for development.
	The source is located well outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, thermokarst terrain.

SITE BD15-28(3)

REFERENCE:	Borrow Area GM-122 Main Canadian Route, CAGSL Pipeline Related Borrow Studies; Northern Engineering Services Co. Ltd., 1974.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel and sand; High moisture content.
OVERBURDEN:	Topsoil and silt; 0 to 60 cm (2 ft.)
RESERVES: Possible	30,000,000 cu.m+ (40,000,000 cu,yd+)
MINIMUM HAUL DISTANCE:	
SITE DESCRIPTION:	Alluvial terrace on the east bank of the Mackenzie River located approximately 19 km (12 mi.) south of Fort Simpson. Thickness: 6 m (20 ft.) Area: 5,000,000 sq m+ (55,000,000 sq ft+) Perimeter: Not determined. Map Reference: NTS 95H, Fort Simpson UTM Reference: Zone 10; 588,000E 6,839,000N
SITE INVESTIGATION:	None
ASSESSMENT:	Suitable for development as a source of general fill. The source is located outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, thermokarst terrain. Selected by CAGSL as a primary source of material for construction of a facility.

SITE BD16-01(3)

REFERENCE:	Deposit H-138, Area II DIAND Granular Resource Inventory; Fort Simpson NTS 95H, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Sand and gravel.
RESERVES: Possible	6,500,000 cu.m (8,500,000 cu.yd.)
SITE DESCRIPTION:	Glaciolacustrine beach deposit located approximately 14 km (9 mi.) south of the confluence of the Jean-Marie Creek and the Mackenzie River.
	Thickness: 3 m (10 ft.) Area: 3,400,000 sq m (37,000,000 sq ft.) Perimeter: 7,900 m (26,000 ft.)
	Map Reference: NTS 95H, Fort Simpson
	UTM Reference: Zone 10; 629,000E 6,809,000N
ASSESSMENT:	Suitable for development.
	The source is located within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat thermokarst terrain. A short access road would link the source to the Mackenzie Highway which provides all-weather access.

SITE BD16-02(3)

REFERENCE:	Deposit H-124,H-125, H-126, Area I DIAND Granular Resource Inventory; Fort Simpson NTS 95H, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Sand and gravel.
RESERVES: Possible	700,000 cu.m (900,000 cu.yd.)
SITE DESCRIPTION:	Glaciolacustrine beach deposits concentrated along bedrock escarpment and extending for more than 30 km (19 mi.).
	Thickness: 3 m (10 ft.) Area: 450,000 sq m (4,900,000 sq ft.) Perimeter: 150,000 m (500,000 ft.)
	Map Reference: NTS 95H, Fort Simpson
	UTM Reference: Zone 10; 640,000E 6,800,000N
ASSESSMENT:	Suitable for development..
	The source is located entirely within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, thermokarst terrain. A short access road would link the source to the Mackenzie Highway which provides all weather access.

SITE BD16-03(2)

REFERENCE:	Deposit H-44, H-137, Area I DIAND Granular Resource Inventory; Fort Simpson NTS 95H, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 2, Good quality material suitable for embankment fill, base and surface course aggregate.
MATERIAL DESCRIPTION:	Gravel and sand.
RESERVES: Possible	100,000,000 cu.m (130,000,000 cu.yd.)
SITE DESCRIPTION:	Glaciofluvial plain bisected by the Mackenzie highway, located approximately 43 km (27 mi.) east of the confluence of the Trout and Mackenzie Rivers.
	Thickness: 15 m (50 ft.) Area: 16,000,000 sq m (170,000,000 sq ft.) Perimeter: 27,000 m (89,000 ft.)
	Map Reference: NTS 95H, Fort Simpson
	UTM Reference: Zone 10; 620,000E 6,805,000N
ASSESSMENT:	Suitable for continued development outside of Mackenzie Highway right-of-way.
	The source is located within the 28 km (17.5 mi.) pipeline corridor. All-weather access is provided along the Mackenzie Highway which bisects the source area. Off highway access is by truck in the winter across flat, thermokarst terrain.
	The source had been previously developed as a source of gravel for construction of the Mackenzie highway.

SITE BD16-04(2)

REFERENCE:	Deposit H-162, H-163, Area I DIAND Granular Resource Inventory; Fort Simpson NTS 95H, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 2, Good quality material suitable for embankment fill, base and surface course aggregate.
MATERIAL DESCRIPTION:	Sand and gravel.
RESERVES: Possible	750,000,000 cu.m (100,000,000 cu.yd.)
SITE DESCRIPTION:	Glaciofluvial plain located approximately 48 km (30 mi.) east of the confluence of the Trout and Mackenzie Rivers. Thickness: 7 m (23 ft.) Area: 29,000,000 sq m (310,000,000 sq ft.) Perimeter: 63,000 m (210,000 ft.) Map Reference: NTS 95H, Fort Simpson UTM Reference: Zone 10; 610,000E 6,790,000N
ASSESSMENT:	Suitable for development. The source is located within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat thermokarst terrain. A short all-weather road would link the source to the Mackenzie Highway which allows all-weather travel.

SITE BD16-05(2)

REFERENCE:	Deposit H-45,H-46,H-157, Area I DIAND Granular Resource Inventory; Fort Simpson NTS 95H, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 2, Good quality material suitable for embankment fill, base and surface course aggregate.
MATERIAL DESCRIPTION:	Sand and gravel.
RESERVES: Possible	250,000,000 cu.m (300,000,000 cu.yd.)
SITE DESCRIPTION:	Glaciofluvial plain bisected by the Mackenzie Highway, located approximately 22 km (14 mi.) west of the confluence of the Mackenzie and Trout Rivers. Thickness: 7.5 m (25 ft.) Area: 77,000,000 sq m (830,000,000 sq ft.) Perimeter: 63,000,000 m (210,000,000 ft.) Map Reference: NTS 95H, Fort Simpson UTM Reference: Zone 10; 640,000E 6,795,000N
ASSESSMENT:	Suitable for continued development outside the Mackenzie Highway right-of-way. The source is located within the 28 km (17.5 mi.) pipeline corridor. Access , all-weather is available along the Mackenzie Highway which bisects the source area. Off highway access is by truck in the winter across flat thermokarst terrain. The source has been previously developed as a source of gravel for construction.

SITE BD16-06(3)

REFERENCE:	Deposit H-47, Area I DIAND Granular Resource Inventory; Fort Simpson NTS 95H, Geological Survey of Canada,1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel and sand.
RESERVES: Possible	20,000,000 cu.m (25,000,000 cu.yd.)
SITE DESCRIPTION:	Glaciofluvial plain overlain by morainal till deposit. The source is bisected by the Mackenzie Highway and located approximately 16 km (10 mi.) southwest of the confluence of the Trout and Mackenzie Rivers. Thickness: 3 m (10 ft.) Area: 20,000,000 sq m (210,000,000 sq ft.) Perimeter: 17,000 m (56,000 ft.) Map Reference: NTS 95H, Fort Simpson UTM Reference: Zone 10; 653,000E 6,790,000N
ASSESSMENT:	Suitable for development continuing outside the Mackenzie Highway right-of-way. The source is located adjacent to the eastern border of the 28 km (17.5 mi.) pipeline corridor. All-weather access is provided by the Mackenzie Highway which bisects the source. Off highway access is by truck in the winter across flat, thermokarst terrain.

SITE BD16-07(2)

REFERENCE:	Deposit E53, Area V, DIAND Granular Resource Inventory; Mills Lake NTS 85E, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 2, Good quality material suitable for embankment fill, base and surface course aggregate.
MATERIAL DESCRIPTION:	Gravel and sand.
RESERVES: Possible	45,000,000 cu.m (60,000,000 cu.yd.)
SITE DESCRIPTION:	Alluvial flood plain and adjacent low terrace of the downstream portion of the Trout River. Thickness: 7.5 m (24 ft.) Area: 15,000,000 sq m (170,000,000 sq ft.) Perimeter: 25,000 m (83,000 ft.) Map Reference: NTS 85E, Mills Lake UTM Reference: Zone 11; 353,000E 6,797,000N
ASSESSMENT:	Suitable for limited development. The source area farthest removed from the active stream channel of the Trout River be considered for initiation of the development operations. The source is located outside the 28 km (17.5 mi.) pipeline corridor. All-weather access is available by linking the source to the Mackenzie Highway, 7 km (4.5 mi.) away. Off-highway access is by truck in the winter.

SITE BD16-08(3)

REFERENCE:	Deposit E1, Area I DIAND Granular Resource Inventory; Mills Lake NTS 85E, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel and/or sand.
RESERVES: Possible	200,000,000 cu. m (250,000,000 cu.yd.)
SITE DESCRIPTION:	Glaciolacustrine ridges on the south side of the Mackenzie River just east of the Trout River. Thickness: 8.2 m (27 ft.) Area: 32,000,000 sq m (340,000,000 sq ft.) Perimeter: 71,000 m (230,000 ft.) Map Reference: NTS 85E, Mills Lake UTM Reference: Zone 11; 355,000E 6,786,000N
ASSESSMENT:	Suitable for development. The source is located outside the 28 km (17.5 mi.) pipeline corridor. All-weather access is possible by linking the source to the Mackenzie Highway 3 km (2 mi.) to 6 km (4 mi.) to the south. Access off-highway is by truck in the winter across flat, thermokarst terrain.

SITE BD16-09(3)

REFERENCE:	Deposit E47, Area VI DIAND Granular Resource Inventory; Mills Lake NTS 85E, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel and sand.
RESERVES: Possible	2,500,000 cu.m (3,500,000 cu.yd.)
SITE DESCRIPTION:	Thin glaciofluvial plain deposit located approximately 14 km (9 mi.) southeast of the confluence of the Trout and Mackenzie Rivers. Thickness: 1.8 m (6 ft.) Area: 3,700,000 sq m (40,000,000 sq ft.) Perimeter: 1,100 m (36,000 ft.) Map Reference: NTS 85E, Mills Lake UTM Reference: Zone 11; 355,000E 6,785,500N
ASSESSMENT:	Suitable for development. The source is located outside the 28 km (17.5 mi.) pipeline corridor. All weather access is possible by linking the source to the Mackenzie Highway located approximately 3 km (2 mi.) south. Off-highway access is by truck in the winter across flat, thermokarst terrain.

SITE BD16-10(3)

REFERENCE:	Deposit E55, Area VI DIAND Granular Resource Inventory; Mills Lake NTS 85E, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel, sand and silt.
RESERVES: Possible	45,000,000 cu.m (60,000,000 cu.yd.)
SITE DESCRIPTION:	Glaciofluvial terrace deposit along Trout River in the vicinity of the Mackenzie Highway crossing. Thickness: 15.5 m (51 ft.) Area: 7,100,000 sq m (77,000,000 sq ft.) Perimeter: 17,000 m (57,000 ft.) Map Reference: NTS 85E, Mills Lake UTM Reference: Zone 11; 347,000E 6,782,000N
ASSESSMENT:	Not suitable for development because the available granular materials occur within or immediately adjacent to the active stream channel of Trout River. The development of this source may detrimentally affect the Mackenzie Highway crossing over the Trout River. The source is located adjacent to the eastern border of the 28 km (17.5 mi.) pipeline corridor. All-weather access is provided by the Mackenzie highway which traverses the source. Off-highway access is by truck in the winter across flat, thermokarst terrain.

SITE BD16-11(3)

REFERENCE:	DIAND Granular Resource Inventory; Mills Lake NTS 85E, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel and cobbles, trace sand.
SITE DESCRIPTION:	Glaciolacustrine beach deposit adjacent to the Mackenzie Highway and located approximately 8 km (5 mi.) east of Trout River.
	Map Reference: NTS 85E, Mills Lake
	UTM Reference: Zone 11; 353,000E 6,783,000N
ASSESSMENT:	Suitable for continued development outside the Mackenzie Highway right-of-way.
	The source is located outside the 28 km (17.5 mi) pipeline corridor. All-weather access is provided by the Mackenzie Highway which passes close to the source. Off highway access is by truck in the winter across flat, thermokarst terrain.
	The source was previously developed as a source of gravel for the construction of the Mackenzie highway.

SITE BD16-12(3)

REFERENCE:	Deposit E48, Area VI DIAND Granular Resource Inventory; Mills Lake NTS 85E, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel, sand and silt.
RESERVES: Possible	15,000,000 cu.m (20,000,000 cu.yd.)
SITE DESCRIPTION:	Hummocky, ridged glaciofluvial deposit located adjacent to Trout River approximately 24 km (15 mi.) south of its confluence with the Mackenzie River. Thickness: 15.5 m (51 ft.) Area: 1,500,000 sq m (16,000,000 sq ft.) Perimeter: 5,100 m (17,000 ft.) Map Reference: NTS 85E, Mills Lake UTM Reference: Zone 11; 340,000E 6,776,200N
ASSESSMENT:	Suitable for development. The source is located within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, thermokarst terrain.

SITE BD16-13(3)

REFERENCE:	Deposit E45, E46, Area VI DIAND Granular Resource Inventory; Mills Lake NTS 85E, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel, sand and silt.
RESERVES: Possible	45,000,000 cu.m (60,000,000 cu.yd.)
SITE DESCRIPTION:	Hummocky glaciofluvial deposits located approximately 32 km (20 mi.) south of the confluence of the Trout and Mackenzie Rivers.
	Thickness: 15.5 m (51 ft.) Area: 4,300,000 sq m (47,000,000 sq ft.) Perimeter: 15,000 m (50,000 ft.)
	Map Reference: NTS 85E, Mills Lake
	UTM Reference: Zone 11; 345,500E 6,758,000N
ASSESSMENT:	Suitable for development.
	The source is located within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, thermokarst terrain.

SITE BD16-14(4)

REFERENCE:	Deposit D-35, DIAND Granular Resource Inventory; Kakisa River NTS 85D, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 4, Poor quality material suitable for marginal fill only.
MATERIAL DESCRIPTION:	Sand and silt.
RESERVES: Possible	2,000,000 cu.m (2,500,000 cu.yd.)
SITE DESCRIPTION:	Alluvial plain located approximately 34 km (21 mi.) south of the confluence of the Trout and Mackenzie Rivers.
	Thickness: 2.4 m (8 ft.) Area: 3,300,000 sq m (36,000,000 sq ft.) Perimeter: 8,200 m (27,000 ft.)
	Map Reference: NTS 85D, Kakisa River
	UTM Reference: Zone 11; 341,000E 6,755,000N
ASSESSMENT:	Suitable for development.
	The source is located near the center of the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat to sloping, thermokarst terrain.

SITE BD16-15(3)

REFERENCE:	Deposit A-14, DIAND Granular Resource Inventory; Trout Lake NTS 95A, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel, sand and silt.
RESERVES: Possible	20,000,000 cu.m (25,000,000 cu.yd.)
SITE DESCRIPTION:	A section of the alluvial flood plain of Trout River, located approximately 48 km (30 mi.) southwest of its confluence with the Mackenzie River. Thickness: 7.5 m (25 ft.) Area: 5,200,000 sq m (56,000,000 sq ft.) Perimeter: 25,000 m (83,000 ft.) Map Reference: NTS 95A, Trout Lake UTM Reference: Zone 10; 630,000E 6,762,000N
ASSESSMENT:	Not suitable for development because available granular materials are within or immediately adjacent to the active stream channel of the Mackenzie River. The source is located outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, thermokarst terrain.

SITE BD16-16(3)

REFERENCE:	Deposit A-42, DIAND Granular Resource Inventory; Trout Lake NTS 95A, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel and sand.
RESERVES: Possible	750,000 cu.m (100,000 cu.yd.)
SITE DESCRIPTION:	Esker ridges located approximately 46 km (29 mi.) southwest of the confluence of the Trout and Mackenzie Rivers. Thickness: 3 m (10 ft.) Area: 3,400 sq m (37,000 sq ft.) Perimeter: 24,000 m (80,000 ft.) Map Reference: NTS 95A, Trout Lake UTM Reference: Zone 10; 639,500E 6,760,500N
ASSESSMENT:	Suitable for development. The source is located adjacent to the western border of the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, thermokarst terrain.

SITE BD16-17(2)

REFERENCE:	Deposit D16, DIAND Granular Resource Inventory; Kakisa River NTS 85D, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 2, Good quality material suitable for embankment fill, base and surface course aggregate.
MATERIAL DESCRIPTION:	Gravel.
RESERVES: Possible	20,000,000 cu.m (25,000,000 cu.yd.)
SITE DESCRIPTION:	Channelled glaciofluvial deposit located approximately 45 km (28 mi.) south of the confluence of the Trout and Mackenzie Rivers. Thickness: 15 m (50 ft.) Area: 3,200,000 sq m (35,000,000 sq ft.) Perimeter: 13,000 m (42,000 ft.) Map Reference: NTS 85D, Kakisa River UTM Reference: Zone 11; 340,000E 6,753,500N
ASSESSMENT:	Suitable for development although precautions will be necessary to ensure that siltation of the adjacent stream is avoided. The source is located within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, thermokarst terrain to the north and east and sloping terrain incised by numerous streams to the west.

SITE BD16-18(3)

REFERENCE:	Deposit D15, D17, D18 DIAND Granular Resource Inventory; Kakisa River NTS 85D, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel and sand.
RESERVES: Possible	150,000,000 cu.m (200,000,000 cu.yd.)
SITE DESCRIPTION:	Glaciofluvial ridges on a till plain located approximately 48 km (30 mi.) south of the confluence of the Trout River and Mackenzie River.
	Thickness: 15 m (50 ft.) Area: 23,000,000 sq m (250,000,000 sq ft.) Perimeter: 38,000 m (125,000 ft.)
	Map Reference: NTS 85D, Kakisa River
	UTM Reference: Zone 11; 340,000E 6,752,000N
ASSESSMENT:	Suitable for development.
	The source is located within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter over flat, thermokarst terrain to the north and east and sloping terrain incised by numerous streams to the east.

SITE BD16-19(3)

REFERENCE:	Deposit D19, DIAND Granular Resource Inventory; Kakisa River NTS 85D, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel and sand.
RESERVES: Possible	150,000,000 cu.m (200,000,000 cu.yd.)
SITE DESCRIPTION:	Glaciofluvial outwash plain containing some ridges, located approximately 26 km (16 mi.) southwest of Redknife Lakes. Thickness: 15 m (50 ft.) Area: 25,000,000 sq m (260,000,000 sq ft.) Perimeter: 34,000 m (110,000 ft.) Map Reference: NTS 85D, Kakisa River UTM Reference: Zone 11; 340,000E 6,740,000N
ASSESSMENT:	Suitable for development. The source is located adjacent to the western border of the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, thermokarst terrain to the north and east and sloping terrain incised by numerous streams to the west.

SITE BD16-20(3)

REFERENCE:	Deposit D20, DIAND Granular Resource Inventory; Kakisa River NTS 85D, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel and sand.
RESERVES: Possible	75,000,000 cu.m (100,000,000 cu.yd.)
SITE DESCRIPTION:	Glaciofluvial ridges on a till plain located approximately 32 km (20 mi.) southwest of Redknife Lakes. Thickness: 15 m (50 ft.) Area: 7,700,000 sq m (83,000,000 sq ft.) Perimeter: 16,000 m (52,000 ft.) Map Reference: NTS 85D, Kakisa River UTM Reference: Zone 11; 372,500E 6,736,000N
ASSESSMENT:	Suitable for development. The source is located adjacent to the western border of the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat. thermokarst terrain to the north and east, and sloping terrain incised by numerous streams to the west.

SITE BD6-21(3)

REFERENCE:	Area III, DIAND Granular Resource Inventory; Mills Lake NTS 85E, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel and sand.
RESERVES: Possible	1,000,000 cu.m (1,500,000 cu.yd.)
SITE DESCRIPTION:	Individual beach ridges located approximately 13 km (8 mi.) north of the confluence of the Trout and Mackenzie Rivers.
	Thickness: 2.7 m (9 ft.) Area: 110,000 sq m (1,200,000 sq ft.) Perimeter: 6,700 m (22,000 ft.)
	Map Reference: NTS 85E, Mills Lake
	UTM Reference: Zone 11; 385,000E 6,813,500N
ASSESSMENT:	Suitable for development.
	The source is located well outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter over flat, thermokarst terrain.

SITE BD16-22(3)

REFERENCE:	Area Miscellaneous, DIAND Granular Resource Inventory; Mills Lake, NTS 85E, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Sand and gravel.
RESERVES: Possible	300,000 cu.m (400,000 cu.yd.)
SITE DESCRIPTION:	Individual beach ridges located approximately 24 km (15 mi.) north of the confluence of the Trout and Mackenzie Rivers. Thickness: 2.7 m (9 ft.) Area: 53,000 sq m (570,000 sq ft.) Perimeter: 17,000 m (57,000 ft.) Map Reference: NTS 85E, Mills Lake UTM Reference: Zone 11; 344,000E 6,824,000N
ASSESSMENT:	Suitable for development. The source is located well outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, thermokarst terrain.

SITE BD17-03(4)

REFERENCE:	Deposit D39, DIAND Granular Resource Inventory; Kakisa River NTS 85D, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Silt and gravel.
RESERVES: Possible	10,000,000 cu.m (15,000,000 cu.yd.)
SITE DESCRIPTION:	Alluvial terrace adjacent to Kakisa River. Thickness: 12 m (40 ft.) Area: 1,500,000 sq m (16,000,000 sq ft.) Perimeter: 6,300 m (21,000 ft.) Map Reference: NTS 85D, Kakisa River UTM Reference: Zone 11, 396,500E 6,719,000N
ASSESSMENT:	Not suitable for development because all available granular materials are located within or immediately adjacent to the active stream channel of the Kakisa River. The source is located well outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, thermokarst terrain. The area is located within a critical wildlife area for beavers.

BD 17.01
BP 17.02
Mining

SITE BD17-04(4)

REFERENCE:	Deposit D40, DIAND Granular Resource Inventory; Kakisa River NTS 85D, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 4, Poor quality material suitable only for marginal fill.
MATERIAL DESCRIPTION:	Silt, sand and gravel.
RESERVES: Possible	20,000,000 cu.m (25,000,000 cu.yd.)
SITE DESCRIPTION:	Alluvial plain along a tributary of the Kakisa River, located approximately 19 km (12 mi.) north of Dogface Lake. Thickness: 12 m (40 ft.) Area: 8,100,000 sq m (88,000,000 sq ft.) Perimeter: 37,000 m (120,000 ft.) Map Reference: NTS 85D, Kakisa River UTM Reference: Zone 11, 390,000E 6,710,000N
ASSESSMENT:	Not suitable for development beacuse all availble granular materials are within or immediately adjacent to the active stream channel. The source is located outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, thermokarst terrain. The source is located within the critical wildlife area for beavers.

SITE BD17-05(3)

REFERENCE:	Deposit D1, DIAND Granular Resource Inventory; Kakisa River NTS 85D, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel and sand.
RESERVES: Possible	25,000,000 cu.m (35,000,000 cu.yd.)
SITE DESCRIPTION:	Glacioflucial outwash plain adjacent to the Kakisa River, located approximately 32 km (20 mi.) northwest of Dogface Lake. Thickness: 15 m (50 ft.) Area: 4,200,000 sq m (45,000,000 sq ft.) Perimeter: 16,000 m (52,000 ft.) Map Reference: NTS 85D, Kakisa River UTM Reference: Zone 11; 356,000E 6,710,000N
ASSESSMENT:	Not suitable for development beacuse available granular materials are located immediately adjacent to the active stream channel of the Kakisa River. The source is located outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, thermokarst terrain. The source is located within a critical wildlife area of the beaver.

SITE BD17-06(3)

REFERENCE:	Deposit D36 - D37, DIAND Granular Resource Inventory; Kakisa River NTS 85D, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Sand and gravel.
RESERVES: Possible	1,500,000 cu.m (2,000,000 cu.yd.)
SITE DESCRIPTION:	Alluvial plain adjacent to the Kakisa River approximately 32 km (20 mi.)northwest of Dogface Lake. Thickness: 2.4 m (8 ft.) Area: 2,400,000 sq m (26,000,000 sq ft.) Perimeter: 10,000 m (31,000 ft.) Map Reference: NTS 85D, Kakisa River UTM Reference: Zone 11; 355,000E 6,709,500N
ASSESSMENT:	Not suitable for development, because the source is located immediately adjacent to the active stream channel of the Kakisa River. The source is located adjacent to the western border of the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat, thermokarst terrain. The source lies within the critical wildlife area of the beaver.

SITE BD17-07(3)

REFERENCE:	Deposit D2, DIAND Granular Resource Inventory; Kakisa River NTS 85D, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel and sand.
RESERVES: Possible	100,000,000 cu.m (150,000,000 cu.yd.)
SITE DESCRIPTION:	Glaciofluvial terrace deposit located adjacent to the Kakisa River approximately 30 km (19 mi.) west of Dogface Lake. Thickness: 15 m (50 ft.) Area: 17,000,000 sq m (190,000,000 sq ft.) Perimeter: 59,000 m (190,000 ft.) Map Reference: NTS 85D, Kakisa River UTM Reference: Zone 11; 350,000E 6,695,000N
ASSESSMENT:	Not suitable for development because the available granular material is located within or adjacent to the active stream channel of the Kakisa River. The source is located outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter over flat to gently sloping terrain. The source is located within a critical wildlife area for beavers.

SITE BD17-08(3)

REFERENCE:	Deposit D61 - D67, DIAND Granular Resource Inventory; Kakisa River NTS 85D, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Sand and gravel.
RESERVES: Possible	1,000,000 cu.m (1,500,000 cu.yd.)
SITE DESCRIPTION:	Esker ridges located approximately 13 km (8 mi.) northeast of Dogface Lake.
	Thickness: 6 m (20 ft.) Area: 130,000 sq m (1,400,000 sq ft.) Perimeter: 43,000 m (140,000 ft.)
	Map Reference: NTS 85D, Kakisa River
	UTM Reference: Zone 11; 400,000E 6,695,000N
ASSESSMENT:	Suitable for development.
	The source is located within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat to gently sloping thermokarst terrain.

SITE BD17-09(3)

REFERENCE:	Deposit D32, DIAND Granular Resource Inventory; Kakisa River NTS 85D, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel and sand.
RESERVES: Possible	40,000,000 cu.m (50,000,000 cu.yd.)
SITE DESCRIPTION:	Glaciofluvial outwash plain located approximately 10 km (6 mi.) ENE of Dogface Lake.
	Thickness: 15 m (50 ft.) Area: 6,100,000 sq m (66,000,000 sq ft.) Perimeter: 14,000 m (47,000ft.)
	Map Reference: NTS 85D, Kakisa River
	UTM Reference: Zone 11; 398,000E 6,691,500N
ASSESSMENT:	Suitable for development.
	The source is located adjacent to the eastern border of the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat to gently sloping thermokarst terrain.

SITE BD17-10(3)

REFERENCE:	Deposit D31, DIAND Granular Resource Inventory; Kakisa River NTS 85D, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel and sand.
RESERVES: Possible	40,000,000 cu.m (50,000,000 cu.yd.)
SITE DESCRIPTION:	Glaciofluvial ridges located approximately 2.5 km (1.5 mi.) northwest of Dogface Lake.
	Thickness: 15 m (50 ft.) Area: 1,900,000 sq m (39,000,000 sq ft.) Perimeter: 16,000 m (52,000 ft.)
	Map Reference: NTS 85D, Kakisa River
	UTM Reference: Zone 11; 378,000E 6,691,000N
ASSESSMENT:	Suitable for development.
	The source is located within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat to gently sloping thermokarst terrain.

SITE BD17-11(3)

REFERENCE:	Deposit D60, DIAND Granular Resource Inventory; Kakisa River NTS 85D, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel and sand.
RESERVES: Possible	25,000,000 cu.m (30,000,000 cu.yd.)
SITE DESCRIPTION:	Glaciofluvial ridges located approximately 13 km (8 mi.) west of Dogface Lake.
	Thickness: 15 m (50 ft.) Area: 2,300,000 sq m (25,000,000 sq ft.) Perimeter: 15,000 m (49,000 ft.)
	Map Reference: NTS 85D, Kakisa River
	UTM Reference: Zone 11; 367,000E 6,693,000N
ASSESSMENT:	Suitable for development.
	The source is located outside the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat to gently sloping, thermokarst terrain.
	The source is located partially within a critical wildlife area for beavers.

SITE BD17-12(3)

REFERENCE:	Deposit D30, DIAND Granular Resource Inventory; Kakisa River NTS 85D, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel and sand.
RESERVES: Possible	45,000,000 cu.m (60,000,000 cu.yd.)
SITE DESCRIPTION:	Glaciofluvial outwash plain located approximately 6 km (4 mi.) west of Dogface Lake.
	Thickness: 15 m (50 ft.) Area: 7,400,000 sq m (80,000,000 sq ft.) Perimeter: 19,000 m (62,000 ft.)
	Map Reference: NTS 85D, Kakisa River
	UTM Reference: Zone 11; 371,000E 6,788,500N
ASSESSMENT:	Suitable for development
	The source is located within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat to gently sloping thermokarst terrain.

SITE BD17-13(2)

REFERENCE:	Deposit D23, DIAND Granular Resource Inventory; Kakisa River NTS 85D, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 2, Good quality material suitable for embankment fill, base and surface course aggregate.
MATERIAL DESCRIPTION:	Gravel.
RESERVES: Possible	2,500,000 cu.m (3,000,000 cu.yd.)
SITE DESCRIPTION:	Glaciofluvial veneer deposit over shale located approximately 5 km (3 mi.) east of Dogface Lake. Thickness: 1.5 m (5 ft.) Area: 3,300,000 sq m (36,000,000 sq ft.) Perimeter: 9,800 m (32,000 ft.) Map Reference: NTS 85D, Kakisa River UTM Reference: Zone 11, 374,500E 6,687,500N
ASSESSMENT:	Suitable for development. The source is located within the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat to gently sloping, thermokarst terrain.

SITE BDI7-14(3)

REFERENCE:	Deposit D22, DIAND Granular Resource Inventory; Kakisa River NTS 85D, Geological Survey of Canada, 1972.
MATERIAL QUALITY:	Class 3, Fair quality material suitable for general fill.
MATERIAL DESCRIPTION:	Gravel and sand.
RESERVES: Possible	45,000,000 cu.m (60,000,000 cu.yd.)
SITE DESCRIPTION:	Glaciofluvial outwash plain located approximately 16 km (10 mi.) west of Dogface Lake.
	Thickness: 15 m (50 ft.) Area: 2,300,000 sq m (25,000,000 sq ft.) Perimeter: 12,000 m (40,000 ft.)
	Map Reference: NTS 85D, Kakisa River
	UTM Reference: Zone 11; 363,000E 6,684,000N
ASSESSMENT:	Suitable for development.
	The source is located adjacent to the western border of the 28 km (17.5 mi.) pipeline corridor. Access is by truck in the winter across flat to sloping thermokarst terrain.
	The source is located within a critical wildlife area for beavers.