

Appendix C

MDH Well Log Reports

340357

County St. Louis
 Quad Duluth
 Quad ID 244D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
 Minnesota Statutes Chapter 1031

Entry Date 08/02/2018
 Update Date 09/04/2018
 Received Date

Well Name	Township	Range	Dir Section	Subsection	Well Depth	Depth Completed	Date Well Completed
	50	14	W 21	DCDACC	20 ft.	20 ft.	06/04/2018
Elevation	1243	Elev. Method	LiDAR 1m DEM (MNDNR)				
Address							
Well 1421 N. 3RD AV W DULUTH MN 55811							
Stratigraphy Information							
Geological Material		From	To (ft.)	Color	Hardness		
CLAYEY SAND		0	15	BROWN	MEDIUM		
SILTY SAND		15	20	BROWN	MEDIUM		
Use environ. bore hole Status Sealed							
Well Hydrofractured? Yes <input type="checkbox"/> No <input type="checkbox"/> From To							
Casing Type Joint							
Drive Shoe? Yes <input type="checkbox"/> No <input type="checkbox"/> Above/Below							
Open Hole From _____ ft. To _____ ft.							
Screen? <input type="checkbox"/> Type Make							
Static Water Level							
Pumping Level (below land surface)							
Wellhead Completion							
Pitless adapter manufacturer				Model			
<input type="checkbox"/> Casing Protection		<input type="checkbox"/> 12 in. above grade					
<input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)							
Grouting Information Well Grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified							
Material		Amount		From		To	
bentonite		2 Sacks		ft. 2		ft.	
Nearest Known Source of Contamination							
feet		Direction				Type	
Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No							
Pump <input type="checkbox"/> Not Installed Date Installed							
Manufacturer's name							
Model Number		HP		Volt			
Length of drop pipe		ft Capacity		g.p.		Typ	
Abandoned							
Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No							
Variance							
Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input type="checkbox"/> No							
Miscellaneous							
First Bedrock				Aquifer			
Last Strat		sand+silt-brown		Depth to Bedrock		ft	
Located by Minnesota Geological Survey							
Locate Method Digitization (Screen) - Map (1:24,000) (15 meters or							
System		UTM - NAD83, Zone 15, Meters		X 567358		Y 5182649	
Unique Number Verification		Site Plan		Input Date		08/02/2018	
Angled Drill Hole							
Well Contractor							
Twin Ports Testing II, Inc.		3704		HALVORSON, M.			
Licensee Business		Lic. or Reg. No.		Name of Driller			

Remarks
 SEALED 6-4-2018 BY 3704.

745808County St. Louis
Quad Duluth
Quad ID 244DMINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
Minnesota Statutes Chapter 1031Entry Date 07/28/2009
Update Date 12/05/2019
Received Date 03/01/2007

Well Name RAPPANA,	Township 50	Range 14	Dir Section W 21	Subsection CDDABD	Well Depth 189 ft.	Depth Completed 189 ft.	Date Well Completed 03/01/2007
Elevation 1241	Elev. Method	LiDAR 1m DEM (MNDNR)			Drill Method	Multiple methods used	Drill Fluid Water
Address C/W 615 BLACKMAN AV S DULUTH MN 55811					Use	domestic	Status Active
Stratigraphy Information					Well Hydrofractured?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	From To
Geological Material From To (ft.) Color Hardness					Casing Type	Single casing	Joint Welded
SANDY CLAY 0 18 BROWN MEDIUM					Drive Shoe?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Above/Below
ROCK 18 189 GRAY HARD					Casing Diameter	Weight	Hole Diameter
					6 in. To 26 ft. 19 lbs./ft.	6 in. To 189 ft.	0 in. To ft.
					Open Hole	From 26 ft. To 189 ft.	
					Screen? <input type="checkbox"/>	Type	Make
					Static Water Level	23 ft. land surface	Measure 03/01/2007
					Pumping Level (below land surface)	160 ft. 2 hrs. Pumping at	2 g.p.m.
					Wellhead Completion	Pitless adapter manufacturer BAKER Model BULLDOG	
					<input type="checkbox"/> Casing Protection	<input type="checkbox"/> 12 in. above grade	
					<input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)		
					Grouting Information	Well Grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified	
					Material	Amount	From To
					bentonite		ft. ft.
					Nearest Known Source of Contamination	55 feet East Direction	Sewer Type
					Well disinfected upon completion?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
					Pump <input type="checkbox"/> Not Installed	Date Installed	06/01/2007
					Manufacturer's name	STA-RITE	
					Model Number	J HP 0.75	Volt 220
					Length of drop pipe	160 ft Capacity 10 g.p.	Typ Submersible
					Abandoned	Does property have any not in use and not sealed well(s)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
					Variance	Was a variance granted from the MDH for this well?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
					Miscellaneous	First Bedrock Duluth Cplx-anorth.series	Aquifer Duluth Cplx-
					Last Strat Duluth Cplx-anorth.series	Depth to Bedrock 18	ft
					Located by	Minnesota Geological Survey	
					Locate Method	Digitization (Screen) - Map (1:12,000) (>15 meters)	
					System	UTM - NAD83, Zone 15, Meters	X 566974 Y 5182707
					Unique Number Verification	Address verification	Input Date 04/28/2016
					Angled Drill Hole		
					Well Contractor	Dennys Drilling, Inc. 1779	KOEPP, D.
					Licensee Business	Lic. or Reg. No.	Name of Driller
Remarks DRILLING METHOD= DRIVEN ROTARY. GROUTING INFORMATION: DRIVEN WITH 8 MESH.					Minnesota Well Index Report		
					745808		
					Printed on 11/06/2023 HE-01205-15		

754614County St. Louis
Quad Duluth
Quad ID 244DMINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
Minnesota Statutes Chapter 1031Entry Date 07/28/2009
Update Date 12/05/2019
Received Date 01/11/2008

Well Name VUKELICH,	Township 50	Range 14	Dir Section W 28	Subsection ABBABB	Well Depth 264 ft.	Depth Completed 264 ft.	Date Well Completed 10/03/2007
Elevation 1248	Elev. Method LiDAR 1m DEM (MNDNR)				Drill Method Multiple methods used	Drill Fluid Water	
Address C/W 413 15TH ST W DULUTH MN 55811					Use domestic	Status Active	
Stratigraphy Information					Well Hydrofractured? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	From 45 ft.	To 264 ft.
Geological Material From To (ft.) Color Hardness SANDY CLAY 0 4 BROWN MEDIUM ROCK 4 264 GRAY HARD					Casing Type Single casing	Joint Welded	
					Drive Shoe? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Above/Below	
					Casing Diameter 6 in.	Weight 19 ft. 19 lbs./ft.	Hole Diameter 10 in. To 19 ft. 6 in. To 264 ft.
					Open Hole From 19 ft. To 264 ft.		
					Screen? <input type="checkbox"/>	Type	Make
					Static Water Level 36 ft. land surface Measure 10/04/2007		
					Pumping Level (below land surface) 250 ft. 2 hrs. Pumping at g.p.m.		
					Wellhead Completion Pitless adapter manufacturer BAKER Model BULLDOG <input type="checkbox"/> Casing Protection <input checked="" type="checkbox"/> 12 in. above grade <input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)		
					Grouting Information Well Grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified Material Amount From To neat cement 8 Sacks 6 ft. 19 ft.		
					Nearest Known Source of Contamination 90 feet West Direction Sewer Type Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
					Pump <input type="checkbox"/> Not Installed Date Installed Manufacturer's name STA-RITE Model Number J HP 1 Volt 220 Length of drop pipe 240 ft Capacity 10 g.p. Typ Submersible		
					Abandoned Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
					Variance Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
					Miscellaneous First Bedrock Duluth Cplx-anorth.series Aquifer Duluth Complex Last Strat Duluth Complex Depth to Bedrock 4 ft Located by Minnesota Geological Survey Locate Method GPS SA Off (averaged) (15 meters) System UTM - NAD83, Zone 15, Meters X 567136 Y 5182534 Unique Number Verification Address verification Input Date 07/05/2017		
					Angled Drill Hole		
					Well Contractor Dennys Drilling, Inc. 1779 NELSON, C. Licensee Business Lic. or Reg. No. Name of Driller		
Remarks DRILLING METHOD= DRIVEN ROTARY.							
Minnesota Well Index Report					754614		
					Printed on 11/06/2023 HE-01205-15		

778106County St. Louis
Quad Duluth
Quad ID 244DMINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
Minnesota Statutes Chapter 1031Entry Date 03/31/2011
Update Date 12/05/2019
Received Date 09/24/2010

Well Name COLE, EITHAN	Township 50	Range 14	Dir Section W 28	Subsection AABBBA	Well Depth 405 ft.	Depth Completed 405 ft.	Date Well Completed 09/24/2010
Elevation 1196	Elev. Method LiDAR 1m DEM (MNDNR)				Drill Method Multiple methods used	Drill Fluid	
Address					Use domestic	Status Active	
Well 224 13TH ST W DULUTH MN 55806					Well Hydrofractured? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	From 120 ft.	To 405 ft.
Contact 2857 EXETER ST DULUTH MN 55806					Casing Type Single casing	Joint Other	
Stratigraphy Information					Drive Shoe? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Above/Below	
Geological Material	From	To (ft.)	Color	Hardness	Casing Diameter	Weight	Hole Diameter
DIRTY GRAVEL	0	9	BROWN	SOFT	6 in. To	24 ft. 19.4 lbs./ft.	6 in. To 405 ft.
CLAY/GRAVEL	9	11	BROWN	MEDIUM			
CLAY	11	24	RED/BRN	MEDIUM			
GRANITE	24	405	GRAY	HARD			
					Open Hole From 24 ft. To 405 ft.		
					Screen? <input type="checkbox"/>	Type	Make
					Static Water Level		
					Pumping Level (below land surface)		
					Wellhead Completion		
					Pitless adapter manufacturer	Model	
					<input type="checkbox"/> Casing Protection	<input checked="" type="checkbox"/> 12 in. above grade	
					<input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)		
					Grouting Information	Well Grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified	
					Material	Amount	From To
					driven casing seal		ft. 24 ft.
					Nearest Known Source of Contamination		
					100 feet	Direction	Type
					Well disinfected upon completion?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
					Pump <input checked="" type="checkbox"/> Not Installed	Date Installed	
					Manufacturer's name		
					Model Number	HP	Volt
					Length of drop pipe	ft	Capacity g.p. Typ
					Abandoned		
					Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
					Variance		
					Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
					Miscellaneous		
					First Bedrock	M.Prot.mafic intr.undif.	Aquifer Duluth Complex
					Last Strat	Duluth Complex	Depth to Bedrock 24 ft
					Located by Minnesota Geological Survey		
					Locate Method Digitization (Screen) - Map (1:12,000) (>15 meters)		
					System	UTM - NAD83, Zone 15, Meters	X 567480 Y 5182526
					Unique Number Verification	Address verification	Input Date 04/28/2016
					Angled Drill Hole		
					Well Contractor		
					Bob Kent Well Drilling	1886	KENT, B.
					Licensee Business	Lic. or Reg. No.	Name of Driller

821830

County St. Louis
 Quad Duluth
 Quad ID 244D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
 Minnesota Statutes Chapter 1031

Entry Date 04/26/2017
 Update Date 09/17/2020
 Received Date 04/17/2017

Well Name DULUTH MW	Township 50	Range 14	Dir Section W 21	Subsection DBBBCB	Well Depth 17.5 ft.	Depth Completed 17.5 ft.	Date Well Completed 04/04/2017
Elevation 1227	Elev. Method LiDAR 1m DEM (MNDNR)				Drill Method Auger (non-specified)	Drill Fluid	
Address Contact 411 FIRST ST W DULUTH MN 55802					Use monitor well	Status Active	
Stratigraphy Information					Well Hydrofractured? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	From	To
Geological Material From To (ft.) Color Hardness					Casing Type Single casing	Joint	
TOP SOIL 0 2 BROWN					Drive Shoe? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Above/Below	
SANDY CLAY 2 10 BROWN					Casing Diameter 2 in. To	Weight 7.5 ft. lbs./ft.	Hole Diameter 10 in. To 17.5 ft.
CLAYEY SAND 10 18 BROWN					Open Hole From ft. To ft.		
					Screen? <input checked="" type="checkbox"/>	Type plastic	Make JOHNSON
					Diameter 2 in.	Slot/Gauze 10	Length 10 ft.
						Set 7.5 ft.	17.5 ft.
					Static Water Level 10.5 ft. land surface Measure 04/04/2017		
					Pumping Level (below land surface)		
					Wellhead Completion Pitless adapter manufacturer PRO TOP Model <input type="checkbox"/> Casing Protection <input checked="" type="checkbox"/> 12 in. above grade <input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)		
					Grouting Information Well Grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified		
					Material bentonite	Amount 1 Sacks	From To ft. 5.5 ft.
					Nearest Known Source of Contamination feet Direction Type Well disinfected upon completion? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
					Pump <input checked="" type="checkbox"/> Not Installed Date Installed Manufacturer's name Model Number HP Volt Length of drop pipe ft Capacity g.p. Typ		
					Abandoned Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
					Variance Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
					Miscellaneous First Bedrock Aquifer Quat. Water Last Strat clay+sand-brown Depth to Bedrock ft Located by Minnesota Geological Survey Locate Method Digitization (Screen) - Map (1:12,000) (>15 meters) System UTM - NAD83, Zone 15, Meters X 567038 Y 5183292 Unique Number Verification Site Plan Input Date 05/01/2017		
Remarks LICENSEE BUSINESS: DAKOTA TECHNOLOGIES.					Angled Drill Hole		
					Well Contractor Dakota Technologies 3553 EYSTAD, C. Licensee Business Lic. or Reg. No. Name of Driller		
Minnesota Well Index Report					821830		Printed on 11/06/2023 HE-01205-15

835884County St. Louis
Quad Duluth
Quad ID 244DMINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
Minnesota Statutes Chapter 1031Entry Date 12/04/2018
Update Date 12/05/2019
Received Date 10/31/2018

Well Name DRCC	Township 50	Range 14	Dir Section W 21	Subsection CDBDCA	Well Depth 340 ft.	Depth Completed 340 ft.	Date Well Completed 10/19/2018
Elevation 1299	Elev. Method LiDAR 1m DEM (MNDNR)				Drill Method Non-specified Rotary	Drill Fluid Water	
Address					Use domestic	Status Active	
Contact 5629 GRAND AV DULUTH MN 55807					Well Hydrofractured? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> From To		
Well 320 ORANGE ST E DULUTH MN 55811					Casing Type Single casing Joint Welded		
Stratigraphy Information					Drive Shoe? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Above/Below		
Geological Material		From	To (ft.)	Color	Hardness	Casing Diameter Weight Hole Diameter	
CLAY		0	12	RED	MEDIUM	6 in. To 17 ft. lbs./ft. 10 in. To 17 ft.	
GRANITE		12	17	GRAY	MED-HRD	6 in. To 340 ft.	
GRANITE		17	340	GRAY	SFT-MED		
					Open Hole From 17 ft. To 340 ft.		
					Screen? <input type="checkbox"/> Type Make		
					Static Water Level		
					30 ft. land surface Measure 10/19/2018		
					Pumping Level (below land surface)		
					330 ft. 1 hrs. Pumping at 1.5 g.p.m.		
					Wellhead Completion		
					Pitless adapter manufacturer Model		
					<input checked="" type="checkbox"/> Casing Protection <input type="checkbox"/> 12 in. above grade		
					<input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)		
					Grouting Information Well Grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified		
					Material Amount From To		
					neat cement 2 Sacks 12 ft. 17 ft.		
					bentonite 2 Sacks ft. 12 ft.		
					Nearest Known Source of Contamination		
					50 feet Southwes Direction Sewer Type		
					Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
					Pump <input checked="" type="checkbox"/> Not Installed Date Installed		
					Manufacturer's name		
					Model Number HP Volt		
					Length of drop pipe ft Capacity g.p. Typ		
					Abandoned		
					Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
					Variance		
					Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
					Miscellaneous		
					First Bedrock Duluth Cplx-anorth.series Aquifer Duluth Complex		
					Last Strat Duluth Complex Depth to Bedrock 17 ft		
					Located by Minnesota Geological Survey		
					Locate Method GPS SA Off (averaged) (15 meters)		
					System UTM - NAD83, Zone 15, Meters X 566773 Y 5182790		
					Unique Number Verification Tax Records Input Date 02/14/2019		
					Angled Drill Hole		
					Well Contractor		
					Sunnarborg Well Drilling Inc. 1295 SEE REMARKS		
					Licensee Business Lic. or Reg. No. Name of Driller		