EMISSION SUMMARY AND DISPERSION MODELLING REPORT
FIELDING CHEMICAL TECHNOLOGIES INC.

Version 2.0

Fielding Chemical Technologies Inc.
3575 Mavis Road, Mississauga, ON

Prepared by:
Fielding Chemical Technologies Inc.
Mississauga, ON.

September 23, 2013

FIELDING
THE SCIENCE OF SUSTAINABILITY™

VERSION CONTROL

VERSION	DATE	REVISION DESCRIPTION	REVIEWER INITIALS
1	January 17, 2013	Final Report	
2	September 23, 2013	Final Report	

Highest Concentration of the Contaminant, and *Table 7, Stream Compositions*. Using the data provided in the tables the maximum emission rates for each significant contaminant emitted from the significant sources are calculated in accordance with s.11 of O. Reg. 419/05, employing the methodology of mass balance and those presented in the EPA[1] documents: *AP42, Compilation of Air Pollutant Emission Factors*, and *Emission Inventory Improvement Program*. The data quality assessment follows the process outlined in the requirements of the ESDM Procedure Document.

A POI concentration for each significant contaminant emitted from the Facility was calculated based on the calculated emission rates and the output from the approved dispersion model are presented in the following Emission Summary Table in accordance with S.26 of O. Reg. 419/05.

Contaminants released by the Facility that are not found on the List of MOE POI Limits are considered to be 'Contaminants with No Ministry POI Limits'. There are 57 'Contaminants with No Ministry POI Limits'- 50 of them were compared against the Jurisdictional Screening Limits (JSL) listed in the MOE document, *"Jurisdictional Screening Level (JSL) List, A Screening Tool for Ontario Regulation 419: Air Pollution – Local Air Quality"* (dated February 2008), while the rest (7) were compared against the threshold concentrations in *Table B-2A, Contaminants Not Listed in the MOE document, "Summary of Standards and Guidelines to Support Ontario Regulation 419: Air Pollution – Local Air Quality" that Can be Considered Insignificant in a Specific Situation* (in MOE Procedure Document.) Each contaminant concentration at Point of Impingement (POI) is below either the respective JSL or the de minimus concentrations.

Of the 122 contaminants assessed, 65 have limits in the List of MOE POI Limits; all the predicted POI concentrations are below the corresponding limits. The highest maximum POI concentration is 92% of the 24-hour limit for Toluene.

[1] U.S. Environmental Protection Agency

Emission Summary Table

Contaminant Name	Contaminant CAS Number	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Max. POI Concentration (µg/m3)	Averaging Period (hours)	MOE POI Limit (µg/m3)	Limiting Effect	Regulation Schedule #	Percentage of MOE POI Limit
Lactic Acid	50-21-5	0.003	AERMOD	1.142	24hr	7		JSL	Below JSL
1,2-Propylene glycol	57-55-6	0.024	AERMOD	2.584	24hr	120	Particulate	Guideline	2%
Diethyl ether	60-29-7	0.427	AERMOD	488	10min	950	Odour	Schedule 3	51%
Diethyl ether	60-29-7	0.427	AERMOD	83	24hr	8,000	Health	Guideline	1%
Ethanol	64-17-5	6.714	AERMOD	7,079	1hr	19,000	Odour	Guideline	37%
Formic Acid	64-18-6	0.796	AERMOD	149	24hr	500	Health	Schedule 3	30%
Methanol (Methyl alcohol)	67-56-1	10.854	AERMOD	1,200	24hr	4,000	Health	Schedule 3	30%
Acetone	67-64-1	48.028	AERMOD	9,868	24hr	11,880	Health	Schedule 3	83%
N,N-Dimethylformamide	68-12-2	0.08	AERMOD	14.4	24hr	80		JSL	Below JSL
1-Butanol	71-36-3	0.88	AERMOD	843	10min	2,100	Odour	Schedule 3	40%
Vinyl chloride	75-01-4	9.48E-03	AERMOD	0.73	24hr	1	Health	Schedule 3	73%
Acetonitrile	75-05-8	0.348	AERMOD	64	24hr	70	Health	Schedule 3	91%
Methylene chloride	75-09-2	3.684	AERMOD	197	24hr	220	Health	Schedule 3	90%
Isobutyl alcohol	78-83-1	0.958	AERMOD	1,351	10min	2,340	Odour	Guideline	58%
Isobutyl alcohol	78-83-1	0.958	AERMOD	114	24hr	4,600	Health	Schedule 3	2%
Methyl ethyl ketone	78-93-3	10.133	AERMOD	817	24hr	1,000	Health	Schedule 3	82%
Trichloroethylene	79-01-6	0.145	AERMOD	7.8	24hr	12	Health	Schedule 3	65%
Methyl acetate	79-20-9	18.655	AERMOD	1,648	24hr	2,400		JSL	Below JSL
1,1,2,2-Tetrachloroethane	79-34-5	0.0013	AERMOD	0.046	24hr	0.1		Table B-2A	Below de minimus level
Methyl methacrylate	80-62-6	0.708	AERMOD	131	24hr	860	Odour	Guideline	15%
Naphthalene	91-20-3	0.007	AERMOD	8	10min	50	Odour	Guideline	16%
Naphthalene	91-20-3	0.007	AERMOD	2.3	24hr	22.5	Health	Guideline	10%
Diphenyl	92-52-4	0.01	AERMOD	6.1	1hr	60	Odour	Guideline	10%
1,2,4-Trimethylbenzene	95-63-6	0.045	AERMOD	7.7	24hr	220	Health	Schedule 3	4%
Gamma-Butyrolactone	96-48-0	0.229	AERMOD	19	24hr	28		JSL	Below JSL
Ethyl methacrylate	97-63-2	0.043	AERMOD	8	24hr	12		JSL	Below JSL
Ethyl lactate	97-64-3	0.066	AERMOD	12	24hr	20		JSL	Below JSL
Parachlorobenzotrifluoride	98-56-6	0.333	AERMOD	61	24hr	70		JSL	Below JSL
N,N-Dimethylcyclohexylamine	98-94-2	0.018	AERMOD	3.369	24hr	40		JSL	Below JSL
p-Cymene	99-87-6	0.242	AERMOD	48	24hr	110		JSL	Below JSL
Ethylbenzene	100-41-4	0.763	AERMOD	177	10min	1,900	Odour	Guideline	9%
Ethylbenzene	100-41-4	2.26	AERMOD	146	24hr	1,000	Health	Schedule 3	15%
Styrene	100-42-5	0.095	AERMOD	17	24hr	400	Health	Schedule 3	4%
Diphenyl ether	101-84-8	0.043	AERMOD	7	24hr	17		JSL	Below JSL

Contaminant Name	Contaminant CAS Number	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Max. POI Concentration (µg/m3)	Averaging Period (hours)	MOE POI Limit (µg/m3)	Limiting Effect	Regulation Schedule #	Percentage of MOE POI Limit
2-Ethylhexyl Acetate	103-09-3	0.033	AERMOD	5.9	24hr	15		JSL	Below JSL
Ethyl propionate	105-37-3	0.146	AERMOD	26	24hr	52		JSL	Below JSL
Dimethyl succinate	106-65-0	0.099	AERMOD	29	24hr	40		JSL	Below JSL
1,2-Epoxybutane	106-88-7	0.046	AERMOD	11	24hr	20		JSL	Below JSL
Diisobutylene	107-39-1	0.878	AERMOD	165	24hr	720		JSL	Below JSL
Methyl propyl ketone	107-87-9	0.762	AERMOD	142	24hr	2120		JSL	Below JSL
1-Propanol	71-23-8	6.004	AERMOD	483	24hr	16,000	Health	Guideline	3%
Methyl isobutyl ketone	108-10-1	4.403	AERMOD	686	24hr	1,200	Odour	Guideline	57%
Isopropyl acetate	108-21-4	1.103	AERMOD	1,749	10min	2,000	Odour	Guideline	87%
Propylene Carbonate	108-32-7	0.011	AERMOD	2.3	24hr	40		JSL	Below JSL
Propylene glycol monomethyl ether acetate	108-65-6	1.363	AERMOD	371	24hr	5,000	Odour	Guideline	7%
Diisobutyl ketone	108-83-8	0.036	AERMOD	40	10min	649	Odour	Guideline	6%
Diisobutyl ketone	108-83-8	0.036	AERMOD	6	24hr	3,500	Health	Guideline	0%
Toluene	108-88-3	9.123	AERMOD	1,843	24hr	2,000	Odour	Guideline	92%
Chlorobenzene	108-90-7	0.254	AERMOD	289	10min	4,500	Odour	Guideline	6%
Chlorobenzene	108-90-7	0.254	AERMOD	175	1hr	3,500	Health	Guideline	5%
Cyclohexanol	108-93-0	0.163	AERMOD	40	24hr	240		JSL	Below JSL
Cyclohexanone	108-94-1	0.865	AERMOD	105	24hr	192		JSL	Below JSL
n-Propyl acetate	109-60-4	10.602	AERMOD	2,280	24hr	6,600	Health	Guideline	35%
n-pentane	109-66-0	34.653	AERMOD	2,914	24hr	4,200		JSL	Below JSL
Tetrahydrofuran	109-99-9	29.046	AERMOD	3,546	24hr	93,000	Odour	Guideline	4%
Methyl isoamyl ketone	110-12-3	0.447	AERMOD	504.9	10min	630	Odour	Guideline	80%
Isobutyl acetate	110-19-0	0.377	AERMOD	416	10min	1,660	Odour	Guideline	25%
Methyl-n-amyl ketone	110-43-0	1.182	AERMOD	269	24hr	4,600	Health	Guideline	6%
n-hexane	110-54-3	26.716	AERMOD	3,601	24hr	7,500	Health	Schedule 3	48%
Cyclohexane	110-82-7	15.859	AERMOD	4,429	24hr	6,100	Health	Schedule 3	73%
Morpholine	110-91-8	0.04	AERMOD	7.2	24hr	16		JSL	Below JSL
2-butoxy-1-ethanol	111-76-2	0.027	AERMOD	29	10min	500	Odour	Guideline	6%
2-butoxy-1-ethanol	111-76-2	0.027	AERMOD	5	24hr	2,400	Health	Guideline	0%
1-Octanol	111-87-5	0.004	AERMOD	0.883	24hr	4		JSL	Below JSL
1-heptyl acetate	112-06-1	0.039	AERMOD	9.6	24hr	16		JSL	Below JSL
Diacetone alcohol	123-42-2	0.452	AERMOD	738	10min	1,350	Odour	Guideline	55%
3-Methyl-1-butanol	123-51-3	0.47	AERMOD	115	24hr	265		JSL	Below JSL
n-Butyl acetate	123-86-4	3.41	AERMOD	738	10min	1,000	Odour	Guideline	74%
n-Butyl acetate	123-86-4	3.41	AERMOD	447	1hr	15,000	Health	Guideline	3%
Tetrachloroethylene	127-18-4	3.77	AERMOD	281	24hr	360	Health	Schedule 3	78%
Dimethylacetamide	127-19-5	0.088	AERMOD	14.6	24hr	300	Health	Guideline	5%
2-Methyl-1-butanol	137-32-6	0.063	AERMOD	10.5	24hr	13		JSL	Below JSL
Diisobutyl adipate	141-04-8	3.74E-05	AERMOD	0.004	24hr	0.1		Table B-2A	Below de minimus level
Ethanolamine	141-43-5	0.048	AERMOD	3.9	24hr	32		JSL	Below JSL

Contaminant Name	Contaminant CAS Number	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Max. POI Concentration (µg/m3)	Averaging Period (hours)	MOE POI Limit (µg/m3)	Limiting Effect	Regulation Schedule #	Percentage of MOE POI Limit
Ethyl acetate	141-78-6	12.869	AERMOD	10,664	1hr	19,000	Odour	Guideline	56%
n-Heptane	142-82-5	10.098	AERMOD	2,616	24hr	11,000	Health	Schedule 3	24%
Di-N-Butyl Ether	142-96-1	0.137	AERMOD	25	24hr	148		JSL	Below JSL
n-nonyl acetate	143-13-5	2.85E-05	AERMOD	0.002	24hr	0.1		Table B-2A	Below de minimus level
Calcium Carbonate	471-34-1	0.007	AERMOD	0.103	24hr	24		JSL	Below JSL
tert-Butyl acetate	540-88-5	0.921	AERMOD	171	24hr	2300		JSL	Below JSL
n-Butyl Propionate	590-01-2	0.102	AERMOD	18	24hr	92		JSL	Below JSL
n-Amyl propionate	624-54-4	0.021	AERMOD	3.3	24hr	21		JSL	Below JSL
Dimethyl adipate	627-93-0	0.008	AERMOD	2.4	24hr	40		JSL	Below JSL
Ethyl-n-butyl ether	628-81-9	3.771	AERMOD	278	24hr	936		JSL	Below JSL
Ethyl 3-ethoxypropionate	763-69-9	0.027	AERMOD	29	10min	200	Odour	Guideline	15%
Propylene Glycol Phenyl Ether	770-35-4	0.002	AERMOD	2.3	24hr	8		JSL	Below JSL
Isobutyl succinate	925-06-4	8.79E-04	AERMOD	0.089	24hr	0.1		Table B-2A	Below de minimus level
Dimethyl glutarate	1119-40-0	0.057	AERMOD	16	24hr	40		JSL	Below JSL
Xylene (mixed isomers)	1330-20-7	2.594	AERMOD	2,322	10min	3,000	Odour	Guideline	77%
Xylene (mixed isomers)	1330-20-7	2.594	AERMOD	349	24hr	730	Health	Schedule 3	48%
Methyl tert-butyl ether	1634-04-4	59.971	AERMOD	5,369	24hr	7,000	Health	Guideline	77%
Ethylene glycol monopropyl ether	2807-30-9	0.058	AERMOD	10	24hr	148		JSL	Below JSL
d-Limonene	5989-27-5	0.257	AERMOD	31	24hr	625		JSL	Below JSL
Sulphur dioxide	7446-09-5	1.144	AERMOD	119	1hr	690	Health&Vegetation	Schedule 3	17%
Sulphur dioxide	7446-09-5	1.144	AERMOD	92	24hr	275	Health&Vegetation	Schedule 3	33%
Sulphur trioxide	7446-11-9	0.021	AERMOD	1.3	24hr	4		JSL	Below JSL
Hydrogen chloride	7647-01-0	0.59	AERMOD	8.977	24hr	20	Health	Schedule 3	45%
Gasoline	8006-61-9	6.312	AERMOD	989	24hr	1400		JSL	Below JSL
Nitrogen oxides	10102-44-0	0.869	AERMOD	58	1hr	400	Health	Schedule 3	15%
Nitrogen oxides	10102-44-0	0.869	AERMOD	44	24hr	200	Health	Schedule 3	22%
Tripropylene glycol methyl ether	25498-49-1	0.002	AERMOD	2.288	24hr	11		JSL	Below JSL
Dipropylene Glycol n-Propyl Ether	29911-27-1	0.004	AERMOD	2.293	24hr	5		JSL	Below JSL
Dipropylene Glycol n-Butyl Ether	29911-28-2	0.003	AERMOD	2.289	24hr	11		JSL	Below JSL
Tripropylene Glycol n-Butyl Ether	55934-93-5	0.002	AERMOD	2.293	24hr	11.6		JSL	Below JSL
Distillates, petroleum, hydrotreated light	64742-47-8	0.077	AERMOD	16	24hr	24		JSL	Below JSL
Light aromatic solvent naphtha	64742-95-6	0.053	AERMOD	11	24hr	305		JSL	Below JSL
Heavy aliphatic solvent naphtha	64742-96-7	0.039	AERMOD	11	24hr	24		JSL	Below JSL
Alcohols, C9-11, ethoxylated, liquids	68439-46-3	2.10E-04	AERMOD	0.037	24hr	0.1		Table B-2A	Below de minimus level

Contaminant Name	Contaminant CAS Number	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Max. POI Concentration (µg/m3)	Averaging Period (hours)	MOE POI Limit (µg/m3)	Limiting Effect	Regulation Schedule #	Percentage of MOE POI Limit
Alcohols, C7-9-iso-, C8-rich (Iso Octyl Alcohol)	68526-83-0	0.001	AERMOD	0.074	24hr	0.1		Table B-2A	Below de minimus level
Alcohols, C6-8 branched (Iso Heptyl Alcohol)	70914-20-4	0.01	AERMOD	0.658	24hr	13		JSL	Below JSL
Pentanedioic acid, bis(2-methylpropyl) ester	71195-64-7	3.26E-04	AERMOD	0.033	24hr	0.1		Table B-2A	Below de minimus level
2-Propanol	67-63-0	6.461	AERMOD	775	24hr	7,300	Health	Schedule 3	11%
Oxo-heptyl acetate	90438-79-2	0.178	AERMOD	36.5	24hr	85	Health	Guideline	43%
Acetic Acid, Alkyl (C8-C10) Esters Mixture	108419-33-6	0.04	AERMOD	8.6	24hr	17		JSL	Below JSL
Mineral spirits	MS-001	0.811	AERMOD	121	24hr	2600	Health	Schedule 3	5%
Suspended particulate matter (< 44 µm diameter)	NA-PM	0.242	AERMOD	34	24hr	120	Visibility	Schedule 3	29%
Chlorinated dibenzo-p-dioxins (CDDs)	NA-CDD	5.25E-09	AERMOD	7.99E-08	24hr	5.00E-06	Health	Guideline	2%
Benzene	71-43-2	4.80E-03	AERMOD	0.255	24hr		CARC	Schedule 3	
Chloroform	67-66-3	1.14E-02	AERMOD	0.854	24hr	1	Health	Schedule 3	85%
Carbon tetrachloride	56-23-5	2.69E-02	AERMOD	2	24hr	2.4	Health	Schedule 3	83%
Methyl Vinyl Ketone	78-94-4	0.0027	AERMOD	0.2	24hr	0.24		JSL	Below JSL
1-Bromopropane	106-94-5	0.05	AERMOD	14	24hr	49		JSL	Below JSL

Notes on Column labelled Regulation Schedule #:

1. "Schedule 3" refers to Standards in Schedule 3 of O. Reg. 419/05.
2. "Guideline" refers to criteria identified as POI Guideline in the document "Summary of Standards and Guidelines to support Ontario Regulation 419: Air Pollution – Local Air Quality" dated February 2008.
3. "JSL" refers to Jurisdictional Screening Limit the "Jurisdictional Screening Level (JSL) List A Screening Tool for Ontario Regulation 419: Air Pollution – Local Air Quality" dated February 2008.
4. "Table B-2A" refers to Table B-2A: Contaminants Not Listed in the MOE document, "Summary of Standards and Guidelines to Support Ontario Regulation 419: Air Pollution – Local Air Quality" that Can Be Considered Insignificant in a Specific Situation, in the MOE document, Procedure for Preparing an Emission Summary and Dispersion Modelling Report, Version 3.0, dated March 2009.