Pollutants of Concern Table Implementation

Permit Review Branch
Kentucky Division for Air Quality

Ben Matar

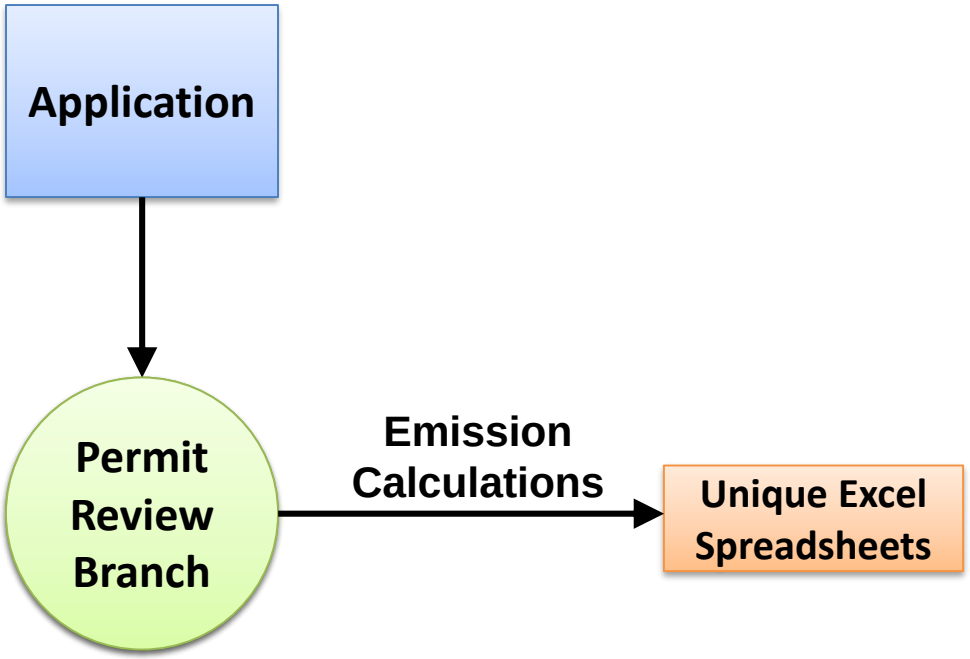
Kentucky
UNBRIDLED SPIRIT

Overview

- **Challenge: Emission Calculation Process**
- **Solution: Standardized Pollutants of Concern (POC) Table**
- **Implementation and Results**
- **Future Plans**

Kentucky
UNBRIDLED SPIRIT

Starting Point



Kentucky
UNBRIDLED SPIRIT

Starting Point

	A	B	C	D	E	F	G
1							
2	**Description**	**Propane Emergency Generator**	**Pollutant**	**Emission Factor (lb/MMBtu)**	**Emission Factor Source**	**Max. Hourly Capacity (lb/hr)**	**PTE (tons/yr)**
3	**Maximum Output (HP)**	**82.3**	**Propane Combustion**				
4	Installation year	2012	CO	3.72	AP 42 3.2-3	0.78	0.195
5	Number of Units	1	NOX	2.21	AP 42 3.2-3	0.46	0.116
6			PT	1.94E-02	AP 42 3.2-3	4.07E-03	1.017E-03
7	**Fuel Type**	**Propane**	PM10	9.50E-03	AP 42 3.2-3	1.99E-03	4.978E-04
8	SCC code	2-02-010-01	PM2.5	9.50E-03	AP 42 3.2-3	1.99E-03	4.978E-04
9	SCC units	1000 gallons	SO2	5.88E-04	AP 42 3.2-3	1.23E-04	3.081E-05
10	Fuel heat content (MMBtu/1000 gal)	91.5	VOCS	2.96E-02	AP 42 3.2-3	6.20E-03	1.551E-03
11	**Hourly capacity per EU (SCC units)***	**0.002291**	CO2	110.00	AP 42 3.2-3	23.06	5.764
12	Yearly capacity per EU (SCC units)	20.07	Methane	2.30E-01	AP 42 3.2-3	4.82E-02	1.205E-02
13	Conversion factor (MMBtu/HP-hr)	0.002546699	Formaldehyde	2.05E-02	AP 42 3.2-3	4.30E-03	1.074E-03
14	**Output (MMBtu/hr)**	**0.2096**	Benzene	1.58E-03	AP 42 3.2-3	3.31E-04	8.279E-05
15			Toluene	5.58E-04	AP 42 3.2-3	1.17E-04	2.924E-05
16	Annual Operation (hrs)	500	Xylenes	1.95E-04	AP 42 3.2-3	4.09E-05	1.022E-05
17			Methanol	3.06E-03	AP 42 3.2-3	6.41E-04	1.603E-04
18			Acetaldehyde	2.79E-03	AP 42 3.2-3	5.85E-04	1.462E-04
19			Acrolein	2.63E-03	AP 42 3.2-3	5.51E-04	1.378E-04

Kentucky UNBRIDLED SPIRIT

Starting Point

3	Emission	Process	Pollutant	Potential To	Allowable	Applicablel	PTE	Uncontrolled	Emission
4	Point			Emit	Emission	Regulation		Emission	Prevention
5				Lb/Hr			Tons/Yr.		
6	**1**	**HV-V6**							
7	**MP1(E1)**	Secondary Molding Machine # 1	PM/PM0	0.1038	2.34	59:010	0.454644	0.454644	0
8		770 Coils/ hr							
9	**MP2(E2)**	Secondary Molding Machine # 2	PM/PM0	0.1038	2.34	59:010	0.454644	0.454644	0
10		770 Coils/ hr							
11									
12	**MP3(E3)**	Core Molding machine # 1	PM/PM0	0.05082	2.34	59:010	0.2225916	0.2225916	0
13		770 Coils/ hr							
14									0
15	**MP4(E4)**	Core Molding machine # 2	PM/PM0	0.05082	2.34	59:010	0.2225916	0.2225916	
16		770 Coils/ hr							
17									
18	**MP5(E5)**	Primary Molding Machine # 1	PM/PM0	0.06776	2.34	59:010	0.2967888	0.2967888	0
19		770 Coils/ hr							
20									
21	**MP6(E6)**	Primary Molding Machine # 2	PM/PM0	0.06776	2.34	59:010	0.2967888	0.2967888	0
22		770 Coils/ hr							
23									
24	**MP7(E7)**	Core Molding Machine # 1	PM/PM0	0.50378	2.34	59:010	2.2062936	2.2062936	0

Kentucky UNBRIDLED SPIRIT

Starting Point

	A	B	G	H	I	J	K	L	M	N	O	P	Q
1	Emission Point	Plating Line Description	Chemical	Max HourlyProduct Usage (gal/hr)	Max Yearly Product Usage (TPY)	PM	Inorg CR (HAP)	Nickle Nitrate (HAP)	Chromic Acid (HAP)	Nitric Acid	HCL (HAP)	Sulfuric Acid	Misc. VOC
2	12	ADJAMATIC	50% NaOH	0.05	10.48	0.524							
3	12	ADJAMATIC	50% NaOH	0.05	10.48	0.524							
4			20% CHROMIC ACID			0.0788			0.0788				
5			35% NITRIC ACID			0.1379				0.1379			
6	12	ADJAMATIC	10% SULFURIC ACID	0.08	3.94	0.0394						0.0394	
7													
8													
9	13	UDYLITE	31.5% HCL	6	125.1	3.94065					3.941		
10			50% CHROMIC ACID			0.02125			0.02125				
11			5% SULFURIC ACID			0.002125						0.0021	
12	13	DMP AUTO	5% HYDROGEN NITRATE	1.5	8.5	0.002125				0.0021			
13	13	DAM AUTO	80% HCL ACID	5	0.06	0.0048					0.005		
14			50% CHROMIC ACID			0.425			0.425				
15			5% SULFURIC ACID			0.0425						0.0425	
16	13	DMP AUTO	5% HYDROGEN NITRATE	1.5	8.5	0.0425				0.0425			
17			20% NaOH			0.0268							
18	13	PREMIUM	30% KOH	0.13	1.34	0.0402							
19			50% CHROMIC ACID			0.0525			0.0525				
20			5% SULFURIC ACID			0.105						0.105	
21	13	PREMIUM	5% HYDROGEN NITRATE	0.02	1.05	0.105				0.105			
22			5% OXALIC ACID			0.0002							
23			15% CHROMIUM NITRATE			0.0006							
24	13	DYE LINE	3% NITRIC ACID	0.03	0.04	0.00012				0.0001			
25	13	DYE LINE	DYE PIGMENTS	0.01	0.1	0.01							
26	13	BRASS CLEANING	DYE PIGMENTS	0.001	0.16	0.016							
27	13	BRASS CLEANING	35.2% HCL	0.3	63.7	2.24224					2.242		

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Starting Point

4			Pollutant	Emission Factor	Emissions lb/hr	Tons/Year	Both Units T/Y	
5	U01, U02	**Two Natural Gas firing boilers**	NOx	100	0.84	2.31	4.62	
6		Units #1 and #2	CO	84	0.71	1.94	3.88	
7		each unit 8.375 MMBtu/hr	VOC	5.5	0.05	0.13	0.25	
8		Heat content of Gas 1000 Btu/scf	PM	1.9	0.02	0.04	0.09	
9		Sulfur content 0.0016%	PM10	5.7	0.05	0.13	0.26	
10			PM2.5	5.7	0.05	0.13	0.26	
11			SO2	0.6	0.01	0.01	0.03	
12								
13							One unit	
14	U01, U02	**Secondary, low sulfur #2 fuel oil**	Pollutant	1000 gal/hr	lb/1000 gal	lb/hr	T/Y	Both Units T/Y
15		Units #1 and #2	NOx	0.06	20.00	1.20	5.26	10.51
16		each unit 8.375 MMBtu/hr	CO	0.06	5.00	0.30	1.31	2.63
17		Heat content 140,000. Btu/gal	VOC	0.06	0.20	0.01	0.05	0.11
18		Sulfur content 0.05%	PM	0.06	2.00	0.12	0.53	1.05
19			PM10	0.06	1.00	0.06	0.26	0.53
20			PM2.5	0.06	1.00	0.06	0.26	0.53
21			SO2	0.06	7.10	0.43	1.87	3.73

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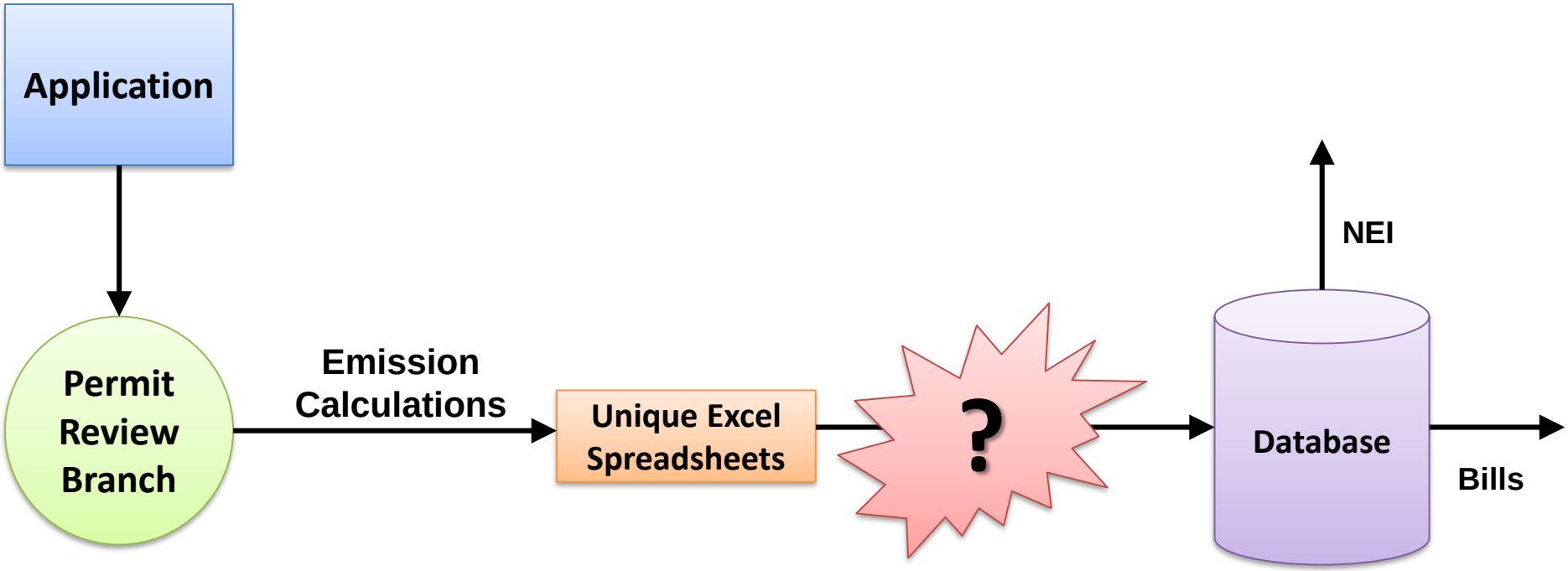
Starting Point

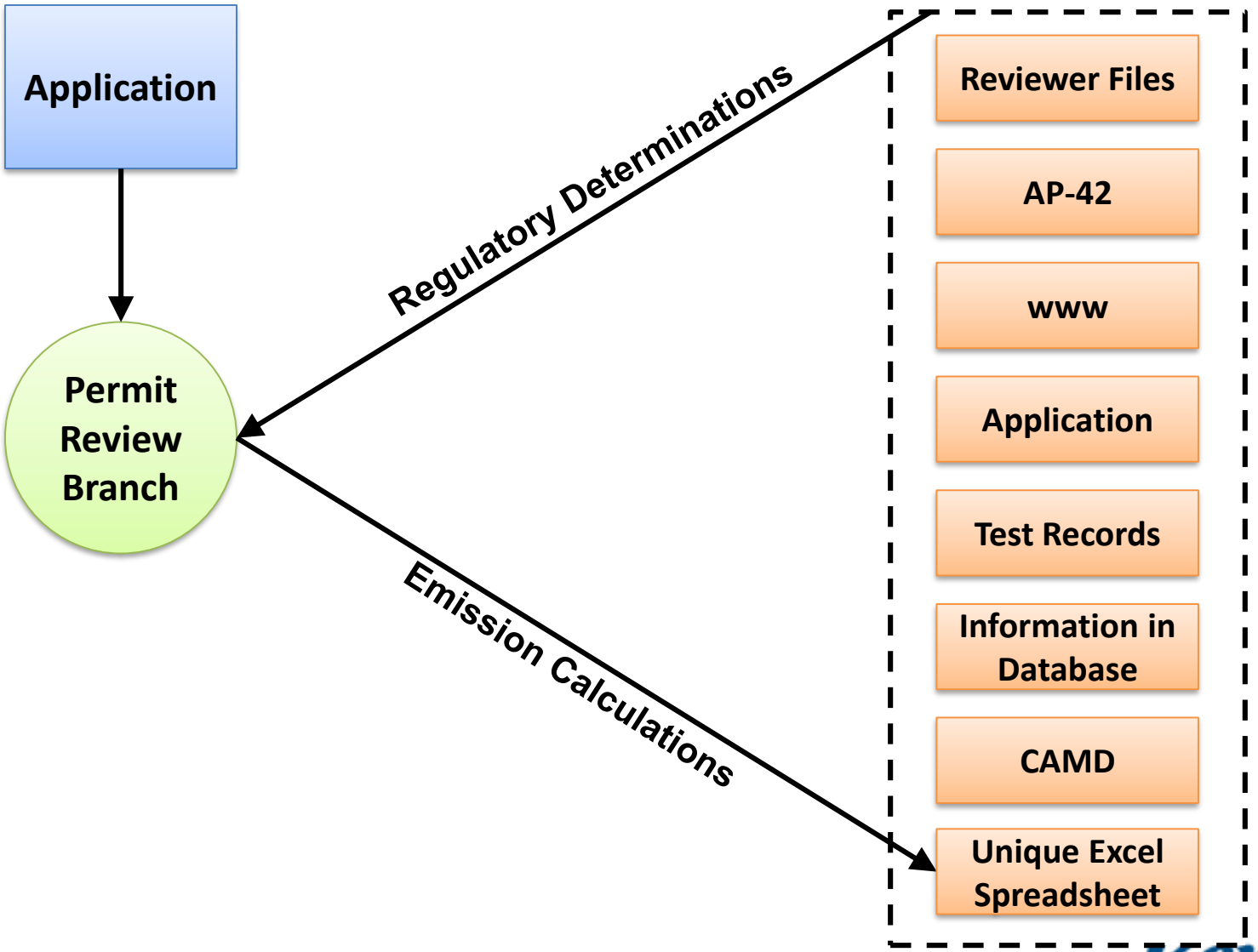


Starting Point

- Database
  - Purpose:
    - Tracks actual emissions
    - Updated based on facility surveys annually
    - Reports to National Emissions Inventory
  - Requirements:
    - Emission calculations based on SCC Codes
    - Stack and control device information
    - Applicable regulations
  - Data sources missing

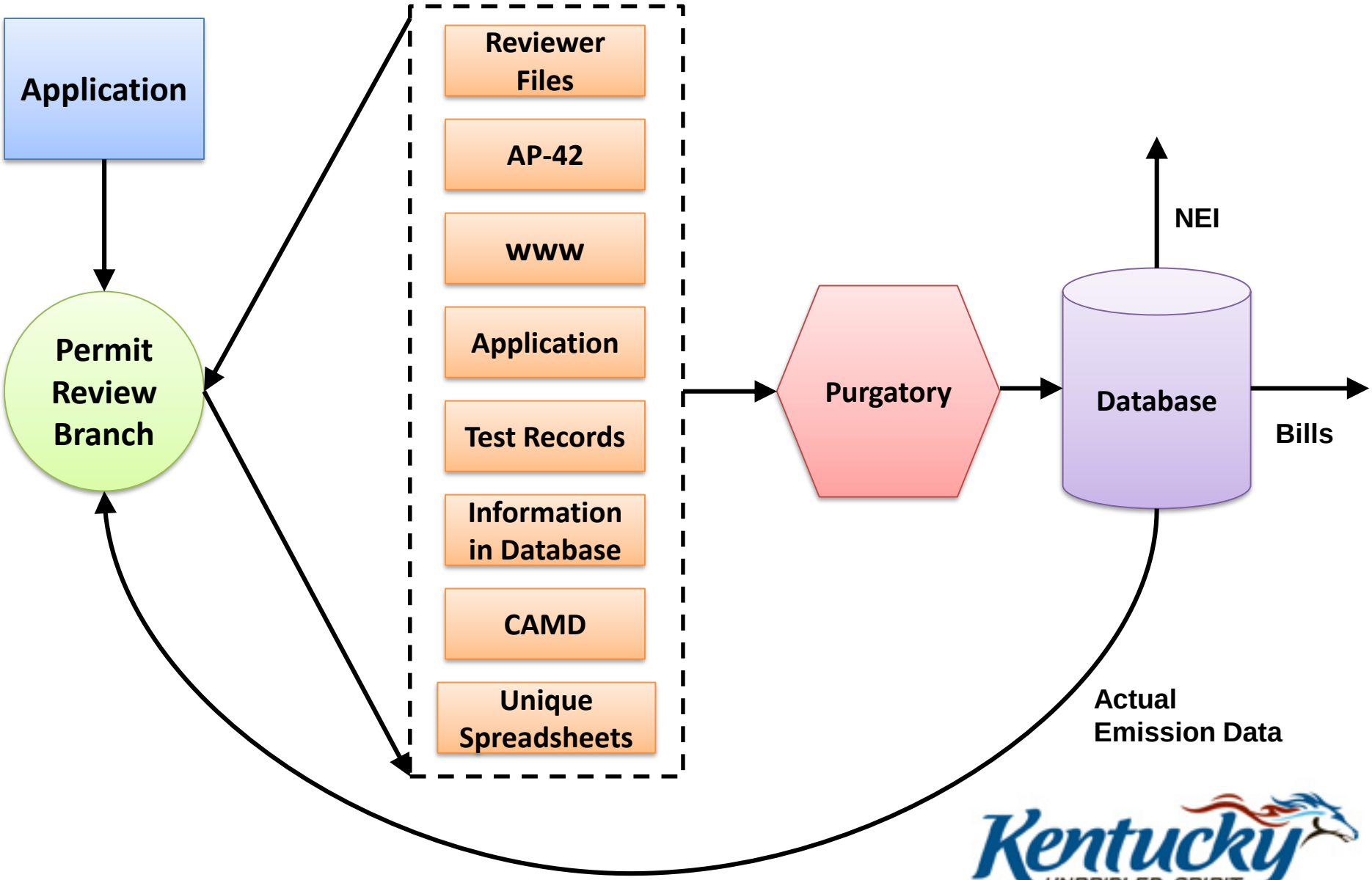
Kentucky UNBRIDLED SPIRIT

Starting Point

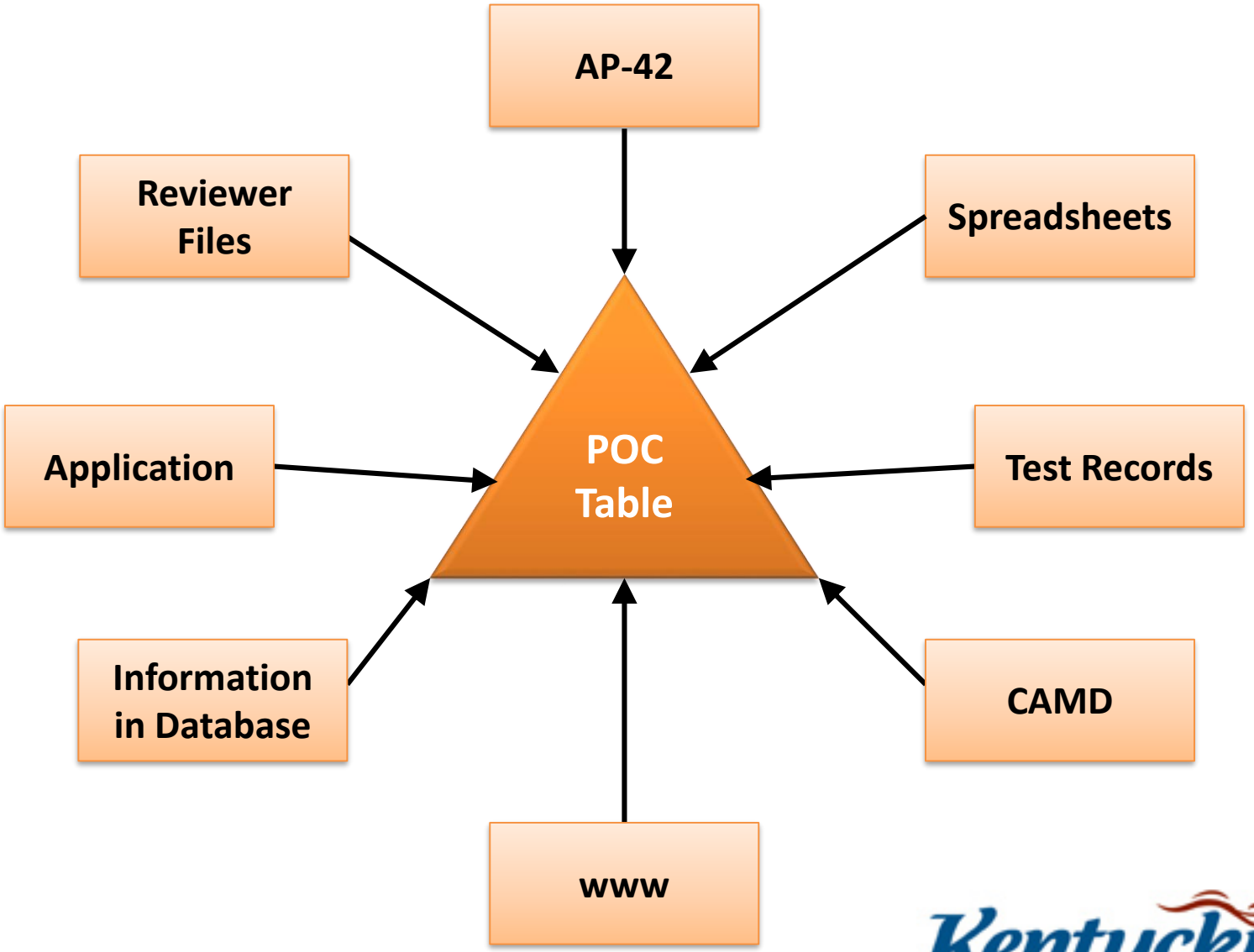


Kentucky UNBRIDLED SPIRIT

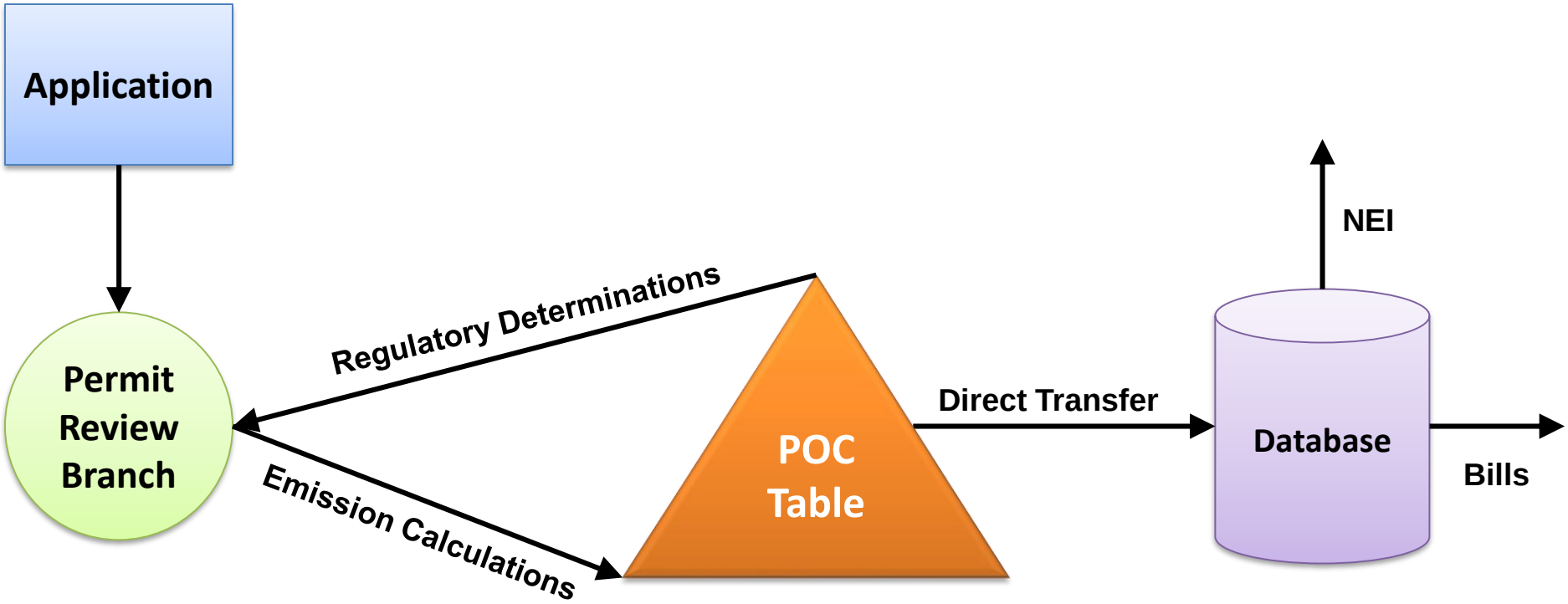
Starting Point



Solution


AP-42
Reviewer Files
Spreadsheets
Application
POC Table
Test Records
Information in Database
CAMD
www

Solution


Application
Permit Review Branch
Regulatory Determinations
Emission Calculations
POC Table
Direct Transfer
Database
NEI
Bills

Solution

- Representatives establish requirements
  - Standardized format with all data
  - Preserve records of Potential to Emit
  - Define choices when necessary
  - Be flexible when possible
  - Provide for future growth
- Permit Support Section
  - Quality assurance
  - Transfer POC to Database

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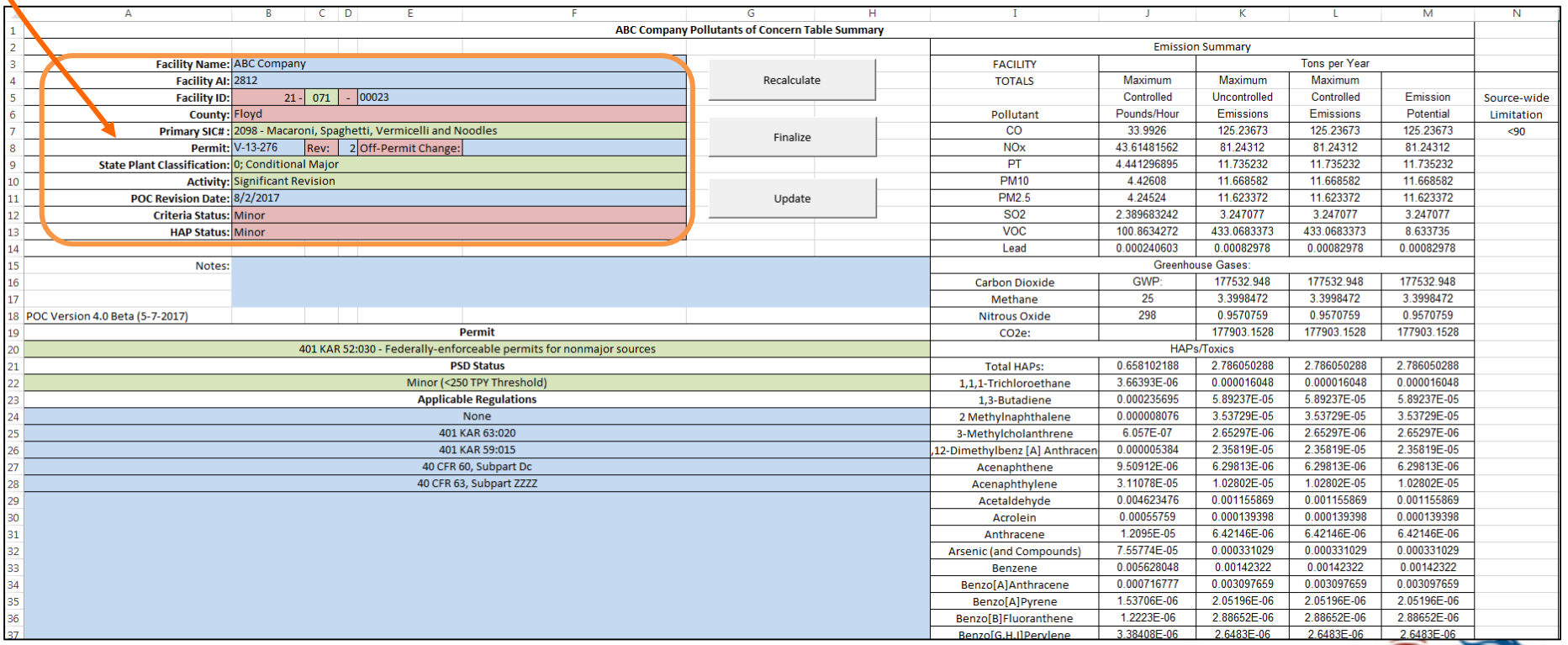
Solution

- POC developed using Excel and Visual Basic for Applications (VBA)
  - Familiar format
  - Color coded system
    - **Blue: Fill in**
    - **Green: Choose from drop-down menu**
    - **Red: Do not edit / will be populated automatically**

Kentucky UNBRIDLED SPIRIT

Solution

- Summary Sheet
  - Facility Information



ABC Company Pollutants of Concern Table Summary

Facility Name:	ABC Company
Facility AI:	2812
Facility ID:	21 - 071 - 00023
County:	Floyd
Primary SIC# :	2098 - Macaroni, Spaghetti, Vermicelli and Noodles
Permit:	V-13-276 Rev: 2 Off-Permit Change:
State Plant Classification:	0; Conditional Major
Activity:	Significant Revision
POC Revision Date:	8/2/2017
Criteria Status:	Minor
HAP Status:	Minor

Recalculate | Finalize | Update

Notes:

POC Version 4.0 Beta (5-7-2017)

Permit

401 KAR 52:030 - Federally-enforceable permits for nonmajor sources

PSD Status

Minor (<250 TPY Threshold)

Applicable Regulations

None
401 KAR 63:020
401 KAR 59:015
40 CFR 60, Subpart Dc
40 CFR 63, Subpart ZZZZ

Emission Summary

FACILITY TOTALS		Tons per Year		
Pollutant	Maximum Controlled Pounds/Hour	Maximum Uncontrolled Emissions	Maximum Controlled Emissions	Emission Potential	Source-wide Limitation
CO	33.9926	125.23673	125.23673	125.23673	<90
NOx	43.61481562	81.24312	81.24312	81.24312	
PT	4.441296895	11.735232	11.735232	11.735232	
PM10	4.42608	11.668582	11.668582	11.668582	
PM2.5	4.24524	11.623372	11.623372	11.623372	
SO2	2.389683242	3.247077	3.247077	3.247077	
VOC	100.8634272	433.0683373	433.0683373	8.633735	
Lead	0.000240603	0.00082978	0.00082978	0.00082978	
Greenhouse Gases:					
Carbon Dioxide	GWP:	177532.948	177532.948	177532.948	
Methane	25	3.3998472	3.3998472	3.3998472	
Nitrous Oxide	298	0.9570759	0.9570759	0.9570759	
CO2e:		177903.1528	177903.1528	177903.1528	
HAPs/Toxics					
Total HAPs:	0.658102188	2.786050288	2.786050288	2.786050288	
1,1,1-Trichloroethane	3.66393E-06	0.000016048	0.000016048	0.000016048	
1,3-Butadiene	0.000235695	5.89237E-05	5.89237E-05	5.89237E-05	
2 Methylnaphthalene	0.000008076	3.53729E-05	3.53729E-05	3.53729E-05	
3-Methylcholanthrene	6.057E-07	2.65297E-06	2.65297E-06	2.65297E-06	
,12-Dimethylbenz [A] Anthracen	0.000005384	2.35819E-05	2.35819E-05	2.35819E-05	
Acenaphthene	9.50912E-06	6.29813E-06	6.29813E-06	6.29813E-06	
Acenaphthylene	3.11078E-05	1.02802E-05	1.02802E-05	1.02802E-05	
Acetaldehyde	0.004623476	0.001155869	0.001155869	0.001155869	
Acrolein	0.00055759	0.000139398	0.000139398	0.000139398	
Anthracene	1.2095E-05	6.42146E-06	6.42146E-06	6.42146E-06	
Arsenic (and Compounds)	7.55774E-05	0.000331029	0.000331029	0.000331029	
Benzene	0.005628048	0.00142322	0.00142322	0.00142322	
Benzo[A]Anthracene	0.000716777	0.003097659	0.003097659	0.003097659	
Benzo[A]Pyrene	1.53706E-06	2.05196E-06	2.05196E-06	2.05196E-06	
Benzo[B]Fluoranthene	1.2223E-06	2.88652E-06	2.88652E-06	2.88652E-06	
Benzo[G,H,I]Perylene	3.38408E-06	2.6483E-06	2.6483E-06	2.6483E-06	

Kentucky UNBRIDLED SPIRIT

Solution

- Summary Sheet – Facility Information

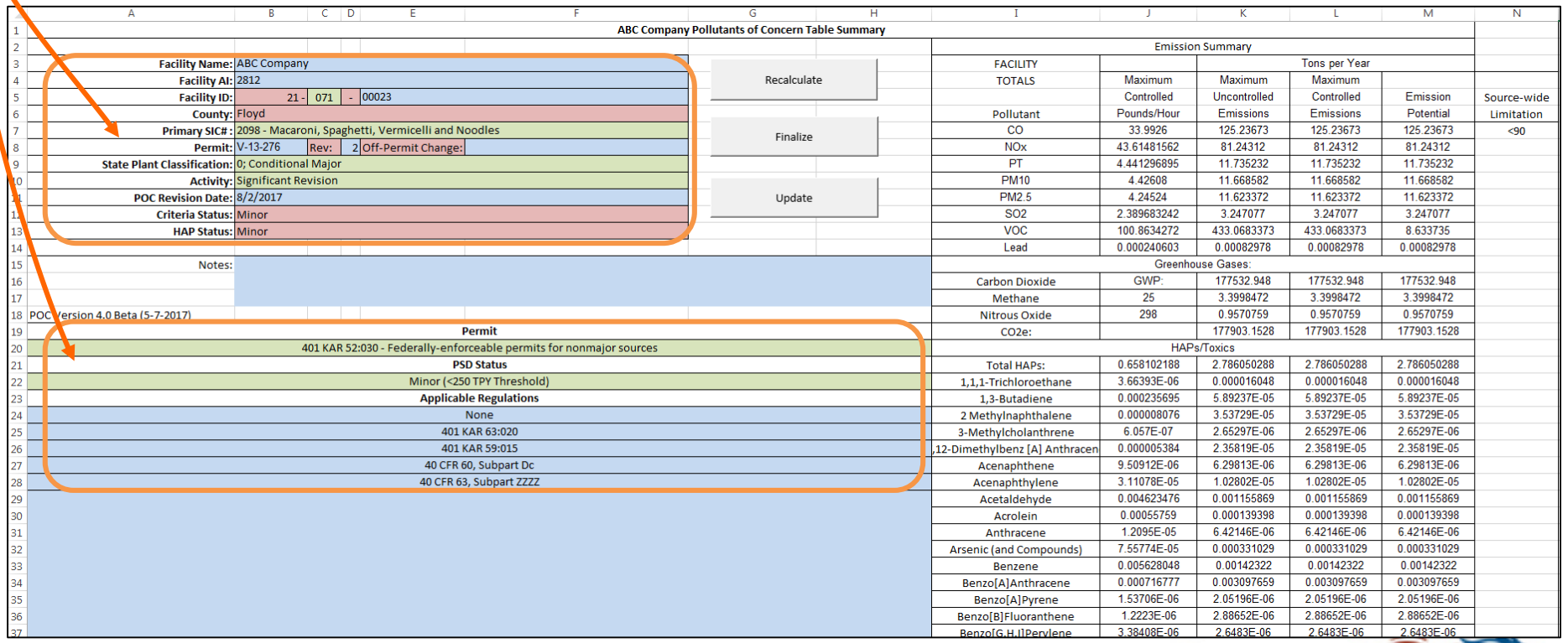
	A	B	C	D	E
1					
2					
3	Facility Name:	ABC Company			
4	Facility AI:	2812			
5	Facility ID:	21 -	071		00023
6	County:	Floyd			
7	Primary SIC# :	2098 - Ma			etti, Vermicelli and Noodles
8	Permit:	V-13-276			Off-Permit Change:
9	State Plant Classification:	0; Conditi			
10	Activity:	Significa			
11	POC Revision Date:	8/2/2017			
12	Criteria Status:	Minor			
13	HAP Status:	Minor			
14					

071
073
075
077
079
081
083
085

Kentucky UNBRIDLED SPIRIT

Solution

- Summary Sheet
  - Facility Information



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Recalculate | Finalize | Update

Notes:

POC Version 4.0 Beta (5-7-2017)

Permit
401 KAR 52:030 - Federally-enforceable permits for nonmajor sources
PSD Status
Minor (<250 TPY Threshold)
Applicable Regulations
None
401 KAR 63:020
401 KAR 59:015
40 CFR 60, Subpart Dc
40 CFR 63, Subpart ZZZZ

Emission Summary

FACILITY TOTALS		Tons per Year			
Pollutant	Maximum Controlled Pounds/Hour	Maximum Uncontrolled Emissions	Maximum Controlled Emissions	Emission Potential	Source-wide Limitation
CO	33.9926	125.23673	125.23673	125.23673	<90
NOx	43.61481562	81.24312	81.24312	81.24312	
PT	4.441296895	11.735232	11.735232	11.735232	
PM10	4.42608	11.668582	11.668582	11.668582	
PM2.5	4.24524	11.623372	11.623372	11.623372	
SO2	2.389683242	3.247077	3.247077	3.247077	
VOC	100.8634272	433.0683373	433.0683373	8.633735	
Lead	0.000240603	0.00082978	0.00082978	0.00082978	
Greenhouse Gases:					
Carbon Dioxide	GWP:	177532.948	177532.948	177532.948	
Methane	25	3.3998472	3.3998472	3.3998472	
Nitrous Oxide	298	0.9570759	0.9570759	0.9570759	
CO2e:		177903.1528	177903.1528	177903.1528	
HAPs/Toxics					
Total HAPs:	0.658102188	2.786050288	2.786050288	2.786050288	
1,1,1-Trichloroethane	3.66393E-06	0.000016048	0.000016048	0.000016048	
1,3-Butadiene	0.000235695	5.89237E-05	5.89237E-05	5.89237E-05	
2 Methylnaphthalene	0.000008076	3.53729E-05	3.53729E-05	3.53729E-05	
3-Methylcholanthrene	6.057E-07	2.65297E-06	2.65297E-06	2.65297E-06	
,12-Dimethylbenz [A] Anthracen	0.000005384	2.35819E-05	2.35819E-05	2.35819E-05	
Acenaphthene	9.50912E-06	6.29813E-06	6.29813E-06	6.29813E-06	
Acenaphthylene	3.11078E-05	1.02802E-05	1.02802E-05	1.02802E-05	
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Benzo[A]Anthracene	0.000716777	0.003097659	0.003097659	0.003097659	
Benzo[A]Pyrene	1.53706E-06	2.05196E-06	2.05196E-06	2.05196E-06	
Benzo[B]Fluoranthene	1.2223E-06	2.88652E-06	2.88652E-06	2.88652E-06	
Benzo[G,H,I]Perylene	3.38408E-06	2.6483E-06	2.6483E-06	2.6483E-06	

Kentucky UNBRIDLED SPIRIT

Solution

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Permit
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PSD Status
Minor (<250 TPY Threshold)
Applicable Regulations
None
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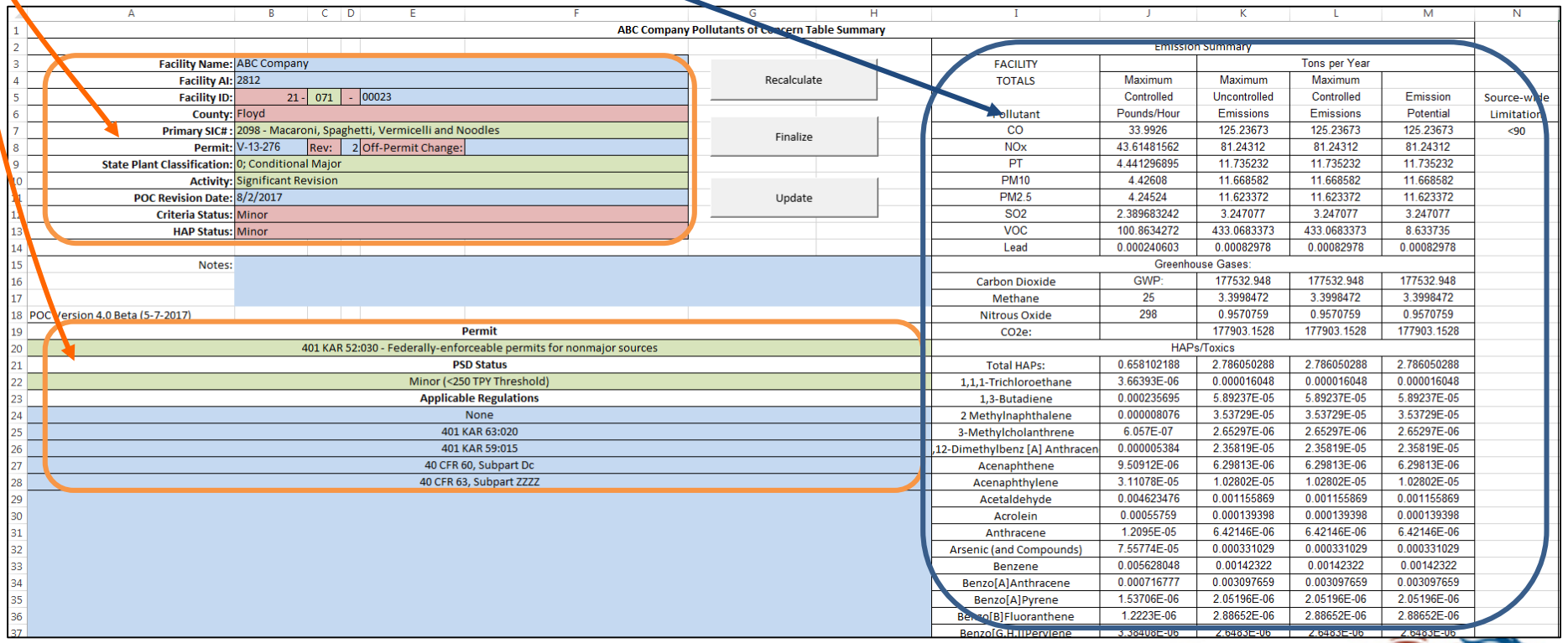
Solution

- Summary Sheet
  - Facility Information
  - Emission Totals



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PM10	4.42608	11.668582	11.668582	11.668582	
PM2.5	4.24524	11.623372	11.623372	11.623372	
SO2	2.389683242	3.247077	3.247077	3.247077	
VOC	100.8634272	433.0683373	433.0683373	8.633735	
Lead	0.000240603	0.00082978	0.00082978	0.00082978	
Greenhouse Gases:					
Carbon Dioxide	GWP:	177532.948	177532.948	177532.948	
Methane	25	3.3998472	3.3998472	3.3998472	
Nitrous Oxide	298	0.9570759	0.9570759	0.9570759	
CO2e:		177903.1528	177903.1528	177903.1528	
HAPs/Toxics					
Total HAPs:	0.658102188	2.786050288	2.786050288	2.786050288	
1,1,1-Trichloroethane	3.66393E-06	0.000016048	0.000016048	0.000016048	
1,3-Butadiene	0.000235695	5.89237E-05	5.89237E-05	5.89237E-05	
2 Methylnaphthalene	0.000008076	3.53729E-05	3.53729E-05	3.53729E-05	
3-Methylcholanthrene	6.057E-07	2.65297E-06	2.65297E-06	2.65297E-06	
,12-Dimethylbenz [A] Anthracen	0.000005384	2.35819E-05	2.35819E-05	2.35819E-05	
Acenaphthene	9.50912E-06	6.29813E-06	6.29813E-06	6.29813E-06	
Acenaphthylene	3.11078E-05	1.02802E-05	1.02802E-05	1.02802E-05	
Acetaldehyde	0.004623476	0.001155869	0.001155869	0.001155869	
Acrolein	0.00055759	0.000139398	0.000139398	0.000139398	
Anthracene	1.2095E-05	6.42146E-06	6.42146E-06	6.42146E-06	
Arsenic (and Compounds)	7.55774E-05	0.000331029	0.000331029	0.000331029	
Benzene	0.005628048	0.00142322	0.00142322	0.00142322	
Benzo[A]Anthracene	0.000716777	0.003097659	0.003097659	0.003097659	
Benzo[A]Pyrene	1.53706E-06	2.05196E-06	2.05196E-06	2.05196E-06	
Benzo[B]Fluoranthene	1.2223E-06	2.88652E-06	2.88652E-06	2.88652E-06	
Benzo[G,H,I]Perylene	3.38408E-06	2.6483E-06	2.6483E-06	2.6483E-06	

Kentucky UNBRIDLED SPIRIT

Solution

- Unit/Process Sheet
  - Unit

POC

Designation:	EN01	Status:	Modify in EIS
Description:	2,291 bhp Generator Engine		
Stack ID:	1	Stack Info:	
Install/Proposed Date:	1996	Stack Diameter (ft):	1
Insignificant Activity:	No	Stack Height (ft):	7.5
Category:	Equipment	Stack Gas Flowrate (acfm):	15342
Type:	Engine	Gas Temperature (deg.F):	965

	Applicable Regulations:		Applicable Regulations:
1	40 CFR 63, Subpart ZZZZ	7	
2		8	
3		9	
4		10	
5		11	
6		12	

Notes:
Changed Unit Description (restriction to operate as emergency engine being removed)
Conversion Factor: 7,000 Btu/(hp-hr)
Fuel Heat Content: 137,000 Btu/gal
Sulfur Content of Fuel: 15 ppm (as required by Subpart ZZZZ
Conversion Factor: 2.205 lb/kg
Conversion from ppm limit using Method 19 Eq. 19-1 and Fd = 9190 scf/MMBtu
Differences in EF's for criteria result from using lb/MMBtu EF basis vs. previous lb/hp-hr basis
Differences in EF's for GHG result from using 40 CFR Part 98 vs. AP-42

Process ID	Description	Control Device Type	% Capture Efficiency	% Control Efficiency	Emission Factor lb/SCC Unit	Pollutant (CAS #)	EF Source	Pollutant Specific Applicable Regulations	Count Toward Title V PTE?	Allowable (lb/hr)	Allowable (TPY)	Controlled lb/hr Maximum	Tons per Year: Maximum Uncontrolled Emissions	Tons per Year: Maximum Controlled Emissions	Tons per Year: Emission Potential		
SCC Code:	2-02-004-01	Hourly Design Rate:	0.117058394	1000 Gallons/		Hours per Year:	8760										
SCC Unit:	1000 Gallons	Max. Yearly Capacity:	1025.431533	1000 Gallons/		Fugitive?:	No									lb/MMBtu	Sub 4Z limit
1	Diesel Combustion		100%	0%	116.45	CO	AP-42 3.4-1	40 CFR 63, Subpart ZZZZ	Yes	12.00773	52.59384	13.63145	59.705751	59.705751	52.59383767	0.85	23 ppm
			100%	0%	438.4	NOx	AP-42 3.4-1		Yes			51.3184	224.774592	224.77459	224.774592	3.2	
			100%	0%	9.5489	PT	AP-42 3.4-2		Yes			1.1177789	4.895871582	4.8958716	4.895871582	0.0697	
			100%	0%	7.8501	PM10	AP-42 3.4-2		Yes			0.9189201	4.024870038	4.02487	4.024870038	0.0573	
			100%	0%	7.6172	PM2.5	AP-42 3.4-2		Yes			0.8916572	3.905458536	3.9054585	3.905458536	0.0556	
			100%	0%	0.207555	SO2	AP-42 3.4-1		Yes			0.024296055	0.106416721	0.1064167	0.106416721	0.001515	
			100%	0%	12.33	VOC	AP-42 3.4-1		Yes			1.44333	6.3217854	6.3217854	6.3217854	0.09	
			100%	0%	22342.2066	Carbon Dioxide	40 CFR 98 Table C-1		Yes			2615.342827	11455.20158	11455.202	11455.20158	163.0818	
			100%	0%	0.906255	Methane	40 CFR 98 Table C-2		Yes			0.106084755	0.464651227	0.4646512	0.464651227	0.006615	
			100%	0%	0.181251	Nitrous Oxide	40 CFR 98 Table C-2		Yes			0.021216951	0.092930245	0.0929302	0.092930245	0.001323	
			100%	0%	0.106312	Benzene	AP-42 3.4-3		Yes			0.012444712	0.054507839	0.0545078	0.054507839	0.000776	
			100%	0%	0.038497	Toluene	AP-42 3.4-3		Yes			0.004506397	0.019738019	0.019738	0.019738019	0.000281	

Solution

- Unit/Process Sheet
  - Unit
    - Stack Parameters
    - Construction Date
    - Identifying Data

Designation:	EN01	Status:	Modify in EIS
Description:	2,291 bhp Generator Engine		
Stack ID:	1	**Stack Info:**	
Install/Proposed Date:	1996	**Stack Diameter (ft):**	1
Insignificant Activity:	No	**Stack Height (ft):**	7.5
Category:	Equipment	**Stack Gas Flowrate (acfm):**	15342
Type:	Engine	**Gas Temperature (deg.F):**	965

Kentucky UNBRIDLED SPIRIT

Solution

- Unit/Process Sheet
  - Unit

POC			
Designation:	EN01	Status:	Modify in EIS
Description:	2,291 bhp Generator Engine		
Stack ID:	1	**Stack Info:**	
Install/Proposed Date:	1996	**Stack Diameter (ft):**	1
Insignificant Activity:	No	**Stack Height (ft):**	7.5
Category:	Equipment	**Stack Gas Flowrate (acfm):**	15342
Type:	Engine	**Gas Temperature (deg.F):**	965

Applicable Regulations:		Applicable Regulations:	
1	40 CFR 63, Subpart ZZZZ	7	
2		8	
3		9	
4		10	
5		11	
6		12	

Notes:
Changed Unit Description (restriction to operate as emergency engine being removed)
Conversion Factor: 7,000 Btu/(hp-hr) — Sulfur Content of Fuel: 15 ppm (as required by Subpart ZZZZ
Fuel Heat Content: 137,000 Btu/gal — Conversion Factor: 2.205 lb/kg — Conversion from ppm limit using Method 19 Eq. 19-1 and Fd = 9190 scf/MMBtu
Differences in EF's for criteria result from using lb/MMBtu EF basis vs. previous lb/hp-hr basis
Differences in EF's for GHG result from using 40 CFR Part 98 vs. AP-42

SCC Code: 2-02-004-01	**Hourly Design Rate:** 0.117058394 1000 Gallons/	**Hours per Year:** 8760	
SCC Unit: 1000 Gallons	**Max. Yearly Capacity:** 1025.431533 1000 Gallons/	**Fugitive?:** No	

Process ID	Description	Control Device Type	% Capture Efficiency	% Control Efficiency	Emission Factor lb/SCC Unit	Pollutant (CAS #)	EF Source	Pollutant Specific Applicable Regulations	Count Toward Title V PTE?	Allowable (lb/hr)	Allowable (TPY)	Controlled lb/hr Maximum	Tons per Year: Maximum Uncontrolled Emissions	Tons per Year: Maximum Controlled Emissions	Tons per Year: Emission Potential	lb/MMBtu	Sub 4Z limit
1	Diesel Combustion		100%	0%	116.45	CO	AP-42 3.4-1	40 CFR 63, Subpart ZZZZ	Yes	12.00773	52.59384	13.63145	59.705751	59.705751	52.59383767	0.85	23 ppm
			100%	0%	438.4	NOx	AP-42 3.4-1		Yes			51.3184	224.774592	224.77459	224.774592	3.2	
			100%	0%	9.5489	PT	AP-42 3.4-2		Yes			1.1177789	4.895871582	4.8958716	4.895871582	0.0697	
			100%	0%	7.8501	PM10	AP-42 3.4-2		Yes			0.9189201	4.024870038	4.02487	4.024870038	0.0573	
			100%	0%	7.6172	PM2.5	AP-42 3.4-2		Yes			0.8916572	3.905458536	3.9054585	3.905458536	0.0556	
			100%	0%	0.207555	SO2	AP-42 3.4-1		Yes			0.024296055	0.106416721	0.1064167	0.106416721	0.001515	
			100%	0%	12.33	VOC	AP-42 3.4-1		Yes			1.44333	6.3217854	6.3217854	6.3217854	0.09	
			100%	0%	22342.2066	Carbon Dioxide	40 CFR 98 Table C-1		Yes			2615.342827	11455.20158	11455.202	11455.20158	163.0818	
			100%	0%	0.906255	Methane	40 CFR 98 Table C-2		Yes			0.106084755	0.464651227	0.4646512	0.464651227	0.006615	
			100%	0%	0.181251	Nitrous Oxide	40 CFR 98 Table C-2		Yes			0.021216951	0.092930245	0.0929302	0.092930245	0.001323	
			100%	0%	0.106312	Benzene	AP-42 3.4-3		Yes			0.012444712	0.054507839	0.0545078	0.054507839	0.000776	
			100%	0%	0.038497	Toluene	AP-42 3.4-3		Yes			0.004506397	0.019738019	0.019738	0.019738019	0.000281	

Solution

- Unit/Process Sheet
  - Unit
    - Unit-Specific Applicable Regulations

	Applicable Regulations:
1	40 CFR 63, Subpart ZZZZ
2	
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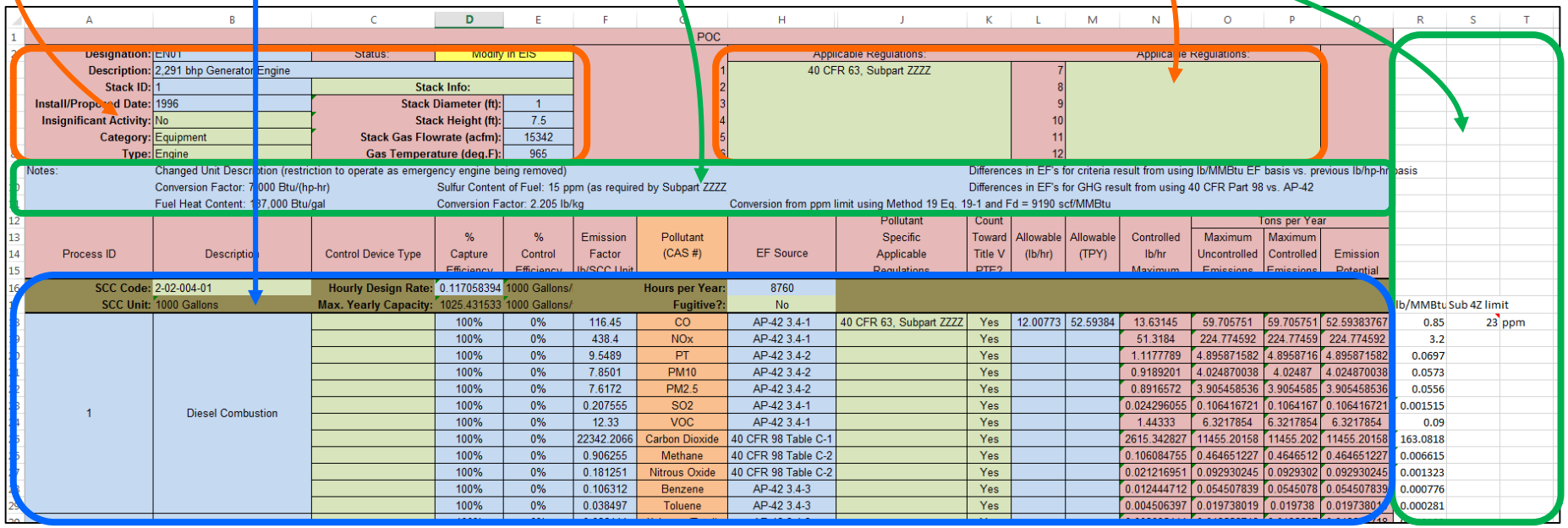
Solution

- Unit/Process Sheet
  - Unit
  - Notes
  - Process



POC

Designation:	EN01
Description:	2,291 bhp Generator Engine
Stack ID:	1
Install/Proposed Date:	1996
Insignificant Activity:	No
Category:	Equipment
Type:	Engine
Status:	Modify in EIS

Stack Info:

Stack Diameter (ft):	1
Stack Height (ft):	7.5
Stack Gas Flowrate (acfm):	15342
Gas Temperature (deg.F):	965

Applicable Regulations:

1 40 CFR 63, Subpart ZZZZ

Applicable Regulations:

7
8
9
10
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Notes:

Changed Unit Description (restriction to operate as emergency engine being removed)
Conversion Factor: 7,000 Btu/(hp-hr)
Fuel Heat Content: 137,000 Btu/gal
Sulfur Content of Fuel: 15 ppm (as required by Subpart ZZZZ
Conversion Factor: 2.205 lb/kg
Differences in EF's for criteria result from using lb/MMBtu EF basis vs. previous lb/hp-hr basis
Differences in EF's for GHG result from using 40 CFR Part 98 vs. AP-42
Conversion from ppm limit using Method 19 Eq. 19-1 and Fd = 9190 scf/MMBtu

Process ID	Description	Control Device Type	% Capture Efficiency	% Control Efficiency	Emission Factor lb/SCC Unit	Pollutant (CAS #)	EF Source	Pollutant Specific Applicable Regulations	Count Toward Title V PTE?	Allowable (lb/hr)	Allowable (TPY)	Controlled lb/hr Maximum	Tons per Year: Maximum Uncontrolled Emissions	Tons per Year: Maximum Controlled Emissions	Tons per Year: Emission Potential	lb/MMBtu	Sub 4Z limit
SCC Code: 2-02-004-01		Hourly Design Rate:	0.117058394	1000 Gallons/		Hours per Year:	8760										
SCC Unit: 1000 Gallons		Max. Yearly Capacity:	1025.431533	1000 Gallons/		Fugitive?:	No									lb/MMBtu	Sub 4Z limit
1	Diesel Combustion		100%	0%	116.45	CO	AP-42 3.4-1	40 CFR 63, Subpart ZZZZ	Yes	12.00773	52.59384	13.63145	59.705751	59.705751	52.59383767	0.85	23 ppm
			100%	0%	438.4	NOx	AP-42 3.4-1		Yes			51.3184	224.774592	224.77459	224.774592	3.2	
			100%	0%	9.5489	PT	AP-42 3.4-2		Yes			1.1177789	4.895871582	4.8958716	4.895871582	0.0697	
			100%	0%	7.8501	PM10	AP-42 3.4-2		Yes			0.9189201	4.024870038	4.02487	4.024870038	0.0573	
			100%	0%	7.6172	PM2.5	AP-42 3.4-2		Yes			0.8916572	3.905458536	3.9054585	3.905458536	0.0556	
			100%	0%	0.207555	SO2	AP-42 3.4-1		Yes			0.024296055	0.106416721	0.1064167	0.106416721	0.001515	
			100%	0%	12.33	VOC	AP-42 3.4-1		Yes			1.44333	6.3217854	6.3217854	6.3217854	0.09	
			100%	0%	22342.2066	Carbon Dioxide	40 CFR 98 Table C-1		Yes			2615.342827	11455.20158	11455.202	11455.20158	163.0818	
			100%	0%	0.906255	Methane	40 CFR 98 Table C-2		Yes			0.106084755	0.464651227	0.4646512	0.464651227	0.006615	
			100%	0%	0.181251	Nitrous Oxide	40 CFR 98 Table C-2		Yes			0.021216951	0.092930245	0.0929302	0.092930245	0.001323	
			100%	0%	0.106312	Benzene	AP-42 3.4-3		Yes			0.012444712	0.054507839	0.0545078	0.054507839	0.000776	
			100%	0%	0.038497	Toluene	AP-42 3.4-3		Yes			0.004506397	0.019738019	0.019738	0.019738019	0.000281	

Kentucky UNBRIDLED SPIRIT

Solution

- Unit/Process Sheet
  - Process

SCC Code:	2-02-004-01
SCC Unit:	1000 Gallons
1	Diesel Combustion

Kentucky UNBRIDLED SPIRIT

Solution

- Unit/Process Sheet
  - Process

Control Device Type	% Capture Efficiency	% Control Efficiency
Hourly Design Rate:	0.11705839	1000 Gallons/
Max. Yearly Capacity:	1025.43153	1000 Gallons/
	100%	0%
	100%	0%
	100%	0%

Emission Factor lb/SCC Unit	Pollutant (CAS #)	EF Source
	Hours per Year:	8760
	Fugitive?:	No
116.45	CO	AP-42 3.4-1
438.4	NOx	AP-42 3.4-1
9.5489	PT	AP-42 3.4-2
7.8501	PM10	AP-42 3.4-2
7.6172	PM2.5	AP-42 3.4-2

Solution

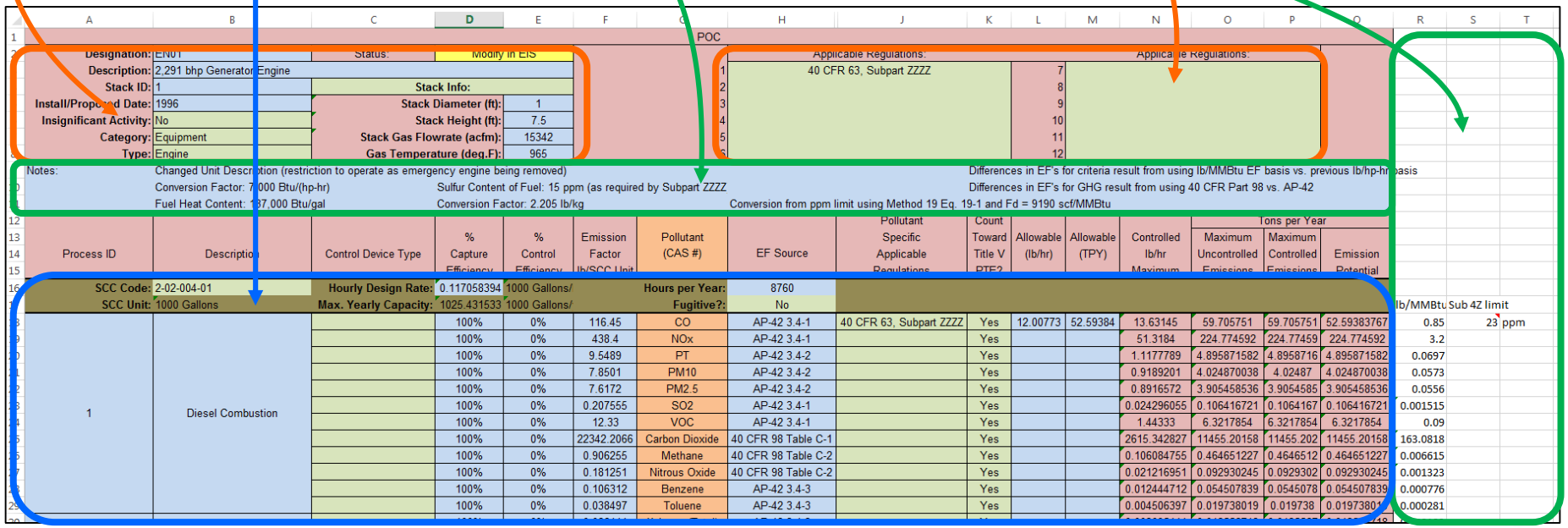
- Unit/Process Sheet
  - Process

Allowable (lb/hr)	Allowable (TPY)	Controlled lb/hr Maximum	Tons per Year		
			Maximum Uncontrolled Emissions	Maximum Controlled Emissions	Emission Potential
12.00773	52.59384	13.63145	59.705751	59.70575	52.59383767
		51.3184	224.774592	224.7746	224.774592
		1.1177789	4.895871582	4.895872	4.895871582
		0.9189201	4.024870038	4.02487	4.024870038
		0.8916572	3.905458536	3.905459	3.905458536
		0.02429606	0.106416721	0.106417	0.106416721

Kentucky UNBRIDLED SPIRIT

Solution

- Unit/Process Sheet
  - Unit
  - Notes
  - Process



POC

Designation:	EN01
Description:	2,291 bhp Generator Engine
Stack ID:	1
Install/Proposed Date:	1996
Insignificant Activity:	No
Category:	Equipment
Type:	Engine
Status:	Modify in EIS

Stack Info:

Stack Diameter (ft):	1
Stack Height (ft):	7.5
Stack Gas Flowrate (acfm):	15342
Gas Temperature (deg.F):	965

Applicable Regulations:

1 40 CFR 63, Subpart ZZZZ

Applicable Regulations:

7
8
9
10
11
12

Notes:

Changed Unit Description (restriction to operate as emergency engine being removed)
Conversion Factor: 7,000 Btu/(hp-hr)
Fuel Heat Content: 137,000 Btu/gal
Sulfur Content of Fuel: 15 ppm (as required by Subpart ZZZZ
Conversion Factor: 2.205 lb/kg
Differences in EF's for criteria result from using lb/MMBtu EF basis vs. previous lb/hp-hr basis
Differences in EF's for GHG result from using 40 CFR Part 98 vs. AP-42
Conversion from ppm limit using Method 19 Eq. 19-1 and Fd = 9190 scf/MMBtu

Process ID	Description	Control Device Type	% Capture Efficiency	% Control Efficiency	Emission Factor lb/SCC Unit	Pollutant (CAS #)	EF Source	Pollutant Specific Applicable Regulations	Count Toward Title V PTE?	Allowable (lb/hr)	Allowable (TPY)	Controlled lb/hr Maximum	Tons per Year: Maximum Uncontrolled Emissions	Tons per Year: Maximum Controlled Emissions	Tons per Year: Emission Potential	lb/MMBtu	Sub 4Z limit
SCC Code: 2-02-004-01		Hourly Design Rate:	0.117058394	1000 Gallons/		Hours per Year:	8760										
SCC Unit: 1000 Gallons		Max. Yearly Capacity:	1025.431533	1000 Gallons/		Fugitive?:	No									lb/MMBtu	Sub 4Z limit
1	Diesel Combustion		100%	0%	116.45	CO	AP-42 3.4-1	40 CFR 63, Subpart ZZZZ	Yes	12.00773	52.59384	13.63145	59.705751	59.705751	52.59383767	0.85	23 ppm
			100%	0%	438.4	NOx	AP-42 3.4-1		Yes			51.3184	224.774592	224.77459	224.774592	3.2	
			100%	0%	9.5489	PT	AP-42 3.4-2		Yes			1.1177789	4.895871582	4.8958716	4.895871582	0.0697	
			100%	0%	7.8501	PM10	AP-42 3.4-2		Yes			0.9189201	4.024870038	4.02487	4.024870038	0.0573	
			100%	0%	7.6172	PM2.5	AP-42 3.4-2		Yes			0.8916572	3.905458536	3.9054585	3.905458536	0.0556	
			100%	0%	0.207555	SO2	AP-42 3.4-1		Yes			0.024296055	0.106416721	0.1064167	0.106416721	0.001515	
			100%	0%	12.33	VOC	AP-42 3.4-1		Yes			1.44333	6.3217854	6.3217854	6.3217854	0.09	
			100%	0%	22342.2066	Carbon Dioxide	40 CFR 98 Table C-1		Yes			2615.342827	11455.20158	11455.202	11455.20158	163.0818	
			100%	0%	0.906255	Methane	40 CFR 98 Table C-2		Yes			0.106084755	0.464651227	0.4646512	0.464651227	0.006615	
			100%	0%	0.181251	Nitrous Oxide	40 CFR 98 Table C-2		Yes			0.021216951	0.092930245	0.0929302	0.092930245	0.001323	
			100%	0%	0.106312	Benzene	AP-42 3.4-3		Yes			0.012444712	0.054507839	0.0545078	0.054507839	0.000776	
			100%	0%	0.038497	Toluene	AP-42 3.4-3		Yes			0.004506397	0.019738019	0.019738	0.019738019	0.000281	

Kentucky UNBRIDLED SPIRIT

Implementation

- Development: 3 months
- Training
  - User resources
  - Rollout schedule
  - Follow-up trainings
- Consistency
- Updates

Kentucky UNBRIDLED SPIRIT

Results

- POC in place for ~2.5 years
  - Initial investment
  - POC tables now in place for many facilities
    - Saves time
    - Good practice
    - Adaptable
  - Refined

Kentucky UNBRIDLED SPIRIT

Future Plans

- Importing from templates
- Automate simple screens of emissions
- Integration with other KDAQ systems

Kentucky
UNBRIDLED SPIRIT

Ben Matar
Permit Review Branch
Combustion Section Supervisor

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Kentucky
UNBRIDLED SPIRIT