



August 31, 2021

MR. DAVID MIELKE
CHEMDESIGN PRODUCTS, INC.
2 STANTON STREET
MARINETTE, WI 54143

Via Email Only to dmielke@chemdesign.com

SUBJECT: Response to Site Investigation Work Plan
ChemDesign Products, Inc. (PFAS)
2 Stanton Street, Marinette, WI
BRRTS #02-38-583852

Dear Mr. Mielke:

On June 17, 2021 the Wisconsin Department of Natural Resources (DNR) received the *Site Investigation Work Plan* ("SI Work Plan") dated June 2, 2021 for the above-referenced site that was submitted by Terracon Consultants, Inc. (Terracon), on behalf of ChemDesign Products, Inc. (ChemDesign¹). The SI Work Plan was accompanied by the appropriate fee of \$700 required under Wisconsin Administrative Code (Wis. Adm. Code) § NR 749.04(1), for formal DNR review and response.

The DNR reviewed ChemDesign's SI Work Plan to investigate per- and polyfluoroalkyl substances (PFAS) contamination at the facility located at 2 Stanton Street, Marinette, Wisconsin ("Site"). The DNR's review also included the information that ChemDesign provided to the DNR on September 13, 2019 following a request for information and on December 9, 2020 in an enforcement conference held by DNR for ChemDesign.

The December 2020 enforcement conference was held to discuss the allegations in the November 24, 2020 Notice of Violation (NOV) for failure to submit a SI Work Plan. Following the enforcement conference, DNR directed ChemDesign to submit a SI Work Plan by February 15, 2021 to investigate all environmental media related to the PFAS discharge at the Site per Wis. Adm. Code ch. NR 716. ChemDesign did not submit an SI Work Plan by this date and requested an extension from DNR. On April 27, 2020, the DNR issued a letter to ChemDesign denying the request for an extension and requiring ChemDesign submit the SI Work Plan as soon as practicable.

The DNR approves ChemDesign's June 2021 SI Work Plan and its proposal to use temporary wells (Wis. Adm. Code § NR 141.29) for the proposed scope of work. The DNR's approval does not imply a complete site investigation per Wis. Adm. Code § 716.11 will result; additional sampling and/or documentation may be required. In this letter, the DNR outlines additional Wis. Adm. Code ch. NR 716 requirements for ChemDesign to address in this phase of work, and acknowledges that other investigation activities are occurring on the property and ChemDesign may incorporate data from these other BRRTS cases into its site investigation, as applicable.

¹ ChemDesign is a current subsidiary of ChemDesign Holdings, Inc. and for purposes of this letter the name ChemDesign is inclusive of all names or parent company relationships that have transpired since 1983.

Background

ChemDesign is a synthetic organic chemistry toll service provider and since 1983 it has leased approximately 7.4 acres on a 66-acre property that is owned by Johnson Controls, Inc. and Tyco Fire Products LP (JCI/Tyco). JCI/Tyco's address is identified as 1 Stanton Street, Marinette, Wisconsin; however, the property is continuous and ChemDesign's buildings are interspersed with JCI/Tyco's operations (Figure 1 and Exhibit 3 **Attachment A**).

JCI/Tyco's PFAS Site Investigation and RCRA Corrective Actions

On July 23, 2018, JCI/Tyco reported a discharge of PFAS at its property and on August 16, 2018, the DNR issued JCI/Tyco a letter notifying of its responsibility to investigate and restore the environment for the discharge of PFAS under BRRTS case #02-38-581955. To date, JCI/Tyco has collected soil samples from seven locations and groundwater samples from 18 monitoring wells for this case. The samples were analyzed for 6 to 14 PFAS compounds and PFAS were detected in the samples. The results suggest that the contamination is from incidental releases of PFAS-containing material, which migrated into soil and groundwater from the surface and/or from structural defects in subgrade process pipes or sewer pipes.

In addition to the recent work for PFAS, the JCI/Tyco (Ansul) BRRTS case # 02-38-000011 is also open for arsenic contamination that was discovered and investigated starting in 1974 and for which JCI/Tyco has implemented corrective measures through the Resource Conservation and Recovery Act (RCRA) program. The completed RCRA corrective action measures include a groundwater barrier wall that encompasses the property, a groundwater extraction system and pump-down program to maintain inward hydraulic gradients, treatment/off-site disposal of captured groundwater, dredging of arsenic-contaminated sediment, capping and removal of arsenic-contaminated soils and institutional controls to restrict site use and access.

Relevant historical information and the DNR's response to JCI/Tyco's investigation and work plan for the PFAS contamination for BRRTS # 02-38-581955 are included in DNR's letter to JCI/Tyco dated, August 31, 2021.

ChemDesign and PFAS

On July 2, 2019, the DNR issued a letter notifying ChemDesign of its responsibility to investigate and restore the environment for the discharge of PFAS at the Site.

ChemDesign began processing PFAS-containing materials at the Site in 2005, when it started providing reactor space to process a series of different perfluorinated compound intermediates from raw materials for JCI/Tyco. ChemDesign stated that all handling of PFAS-containing materials occurs above ground and no spills have been reported. It also stated that waste streams in contact with PFAS-containing materials are either recycled within the process or captured and disposed of off-site through incineration. ChemDesign's process flow diagrams for PFAS-containing materials are included in **Attachment A** (titled Attachment 1.1 to Attachment 1.9).

Although ChemDesign reports that all PFAS-containing materials are either recycled or disposed of off-site through incineration, PFAS have been detected in its wastewater. As part of its investigation into PFAS contamination in the sanitary sewer system, the city of Marinette collected wastewater samples from the ChemDesign's industrial sewer discharge three times between December 2018 and June 2020; perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) were detected at concentrations that ranged from 1,120 to 3,700 ppt and from 48 to 51 ppt, respectively (**Attachment B**).

ChemDesign has reported no other handling of PFAS-containing materials at the Site, except for in the aqueous film forming foam (AFFF) used in its fire suppression system in Building 69, which has not been deployed for use in firefighting but which was occasionally discharged to the ground for testing purposes starting around 2016.

Summary of SI Work Plan

ChemDesign's stated objective in the SI Work Plan is to evaluate soil, groundwater and air for PFAS in the vicinity of the areas ChemDesign leases from JCI/Tyco and to avoid duplicative work with the PFAS-site investigation being undertaken by JCI/Tyco for BRRTS #02-38-581955.

ChemDesign's proposed scope of work in its SI Work Plan included:

- Collection of soil samples from 11 locations on the Site in the vicinity of ChemDesign's operations that handle PFAS-containing material, including one sample near Building 69 where AFFF was historically deployed for testing of the fire suppression system (Exhibit 3 in **Attachment A**). Up to two samples will be collected from each location; one from unsaturated soil in the upper 4 feet, and a second from between 4 and 10 feet below ground surface (ft bgs), if unsaturated soil is present in this deeper zone².
- Collection of groundwater samples from 11 temporary wells with a 5 to 10-foot PVC well screen installed to a depth of approximately 10 ft bgs at each soil boring location. The wells will be developed prior to collection of the samples but will be installed to less stringent standards than permanent NR 141 monitoring wells.
- Abandonment of the temporary wells after sampling.
- Analysis of the soil and groundwater samples for 33 PFAS compounds.

No air sampling is proposed in the SI Work Plan. ChemDesign stated that there is no currently approved method for air sampling for PFAS, and ChemDesign reported its reactors that process PFAS-containing materials are sealed, and if they are vented any vapors are collected and returned to the reactor or disposed of as a waste.

ChemDesign plans to provide a report summarizing the results within 60 days of receipt of the laboratory data. The report will include documentation of field activities, map of sample locations, soil boring logs, laboratory analytical results, data evaluation and pertinent findings and recommendations for further action, if needed.

DNR Review

The DNR reviewed ChemDesign's SI Work Plan and finds that it is scoped to evaluate PFAS contamination in the soil and shallow groundwater near areas where PFAS were handled above ground by ChemDesign on the Stanton property. The results of the proposed work, when evaluated with data available from related BRRTS cases on the property (e.g. JCI/Tyco's BRRTS cases #02-38-00011 and 02-38-581955) can be used by ChemDesign to evaluate its potential contributions to sources of PFAS contamination at Site, evaluate completeness of its Wis. Adm. Code ch. NR 716 site investigation and make recommendations for next steps per Wis. Adm. Code § NR 716.15(6).

The DNR approves ChemDesign's proposal to use temporary monitoring wells per Wis. Adm. Code § NR 141.29, if ChemDesign incorporates the following items into its sampling and documentation of these wells.

- Prevent stormwater/surface water from entering each temporary monitoring well.
- Document conditions at each temporary well head during sampling; include photos and summary of the surface conditions near each sample location in the documentation report.

² The groundwater elevations at the Site, as measured for BRRTS# 02-38-00011, have been increasing in recent years and are less than 1 foot bgs in some areas; therefore, the DNR anticipates that unsaturated soil will not be encountered below 4 feet and ChemDesign will only collect one soil sample from each location.

- Measure and record water level in each temporary monitoring well prior to and after purging; include water level data in the documentation report.
- Document water turbidity at time of sampling; include turbidity data in the documentation report. (ChemDesign proposed to sample the temporary wells after purging yields clear water. The DNR agrees with this sampling procedure because turbid samples collected from temporary wells have been shown to affect the quality and usability of the PFAS sampling results.).

In addition to the documentation items noted above for the temporary wells, **incorporate the following items into the documentation report for this phase of work.**

- Discuss whether there are any sewer or subgrade process lines where PFAS-containing materials may enter during ChemDesign's operations and explain why PFAS were detected in samples of ChemDesign's industrial wastewater collected by the city of Marinette (**Attachment B**). Include maps of sanitary sewer or subgrade process lines used by ChemDesign (Wis. Adm. Code NR § 716.11(5)(a)).
- Compare the PFAS results from the soil and groundwater samples ChemDesign collects with the results available from JCI/Tyco's site investigation for BRRTS #02-38-581955. The DNR recommends this comparison to evaluate if results are indicative of potential source area(s) in the vicinity of ChemDesign's operations (Wis. Adm. Code § NR 716.11(5)(e)) and assist in defining the degree and extent of contamination (Wis. Adm. Code § NR 716.11(3)(a)).
- Compare the groundwater sample results to the Wisconsin Department of Health Services' (DHS's) Cycle 11 recommended groundwater standards³ (Wis. Adm. Code § NR 722.09(2)(b)2.).
- Include discussion of the activities where ChemDesign has air permits at the Site, if there are PFAS containing materials used within these activities, and the potential for PFAS air emissions from these activities. Speak to any processes where PFAS could be mobilized in air via aerosols or steam (Wis. Adm. Code NR § 716.11(5)(a)). (Remove the proposed air sample location from the figures if no air sampling is performed).
- Include documentation of disposal of investigative derived waste (Wis. Adm. Code § NR 716.11(6)).

The DNR also recommends that ChemDesign complete the following:

- Analyze the PFAS samples it collects for the same 36 PFAS compounds that JCI/Tyco is required to report for BRRTS #02-38-581955 (i.e., add 10:2 fluorotelomer sulfonic acid [FTS], perfluorohexadecanoic acid [PFHxDA] and perfluorooctadecanoic acid [PFODA] to this list of 33 PFAS proposed in the SI Work Plan). This will provide for a consistent analyte list for samples collected on the property.
- Compare the PFAS results for the groundwater samples collected from temporary well(s) to the most recent groundwater sample results available for any of JCI/Tyco's permanent well(s) that are screened near the temporary well sample location (e.g. P-11 compared to MW54S). The comparison is recommended to support conclusions on the quality and usability of the PFAS results for samples collected from temporary wells.

Conclusions and Next Steps:

ChemDesign may proceed with its SI Work Plan to investigate PFAS contamination in the vicinity of the areas that ChemDesign leases from JCI/Tyco. ChemDesign is reminded that data from related BRRTS cases on or surrounding the property can be incorporated into its site investigation where warranted and applicable.

³ On November 6, 2020, the DHS recommended groundwater standards for PFAS, which brought the total number of PFAS compounds with recommended standards to 18 PFAS ("Cycle 11"). <https://www.dhs.wisconsin.gov/water/gws-cycle11.htm>

The next steps required by ChemDesign for the Site are as follows:

- Within 60 days of receipt of this letter, complete the sampling proposed in the SI Work Plan, including the additional requirements identified above (Wis. Adm. Code § NR 716.11(2r)).
- Within 10 days of receipt of the final laboratory report, provide a copy of the data to the property owner (JCI/Tyco) and the DNR per Wis. Adm. Code § NR 716.14. (Use of form 4400-249 is not required).
- Within 60 days of receipt of the final laboratory report, submit the documentation report proposed in the SI Work Plan, including the additional requirements identified above (Wis. Adm. Code § NR 716.15).

As a reminder, this Site is subject to an enforcement action and therefore all submittals to the DNR under Wis. Adm. Code chs. NR 700-799 and submittals directed by the DNR must be accompanied by an Wis. Adm. Code ch. NR 749 fee per Wis. Stat. § 292.94. These fees are not pro-ratable or refundable per Wis. Adm. Code § NR 749.04(1). If you have any questions about whether to include a fee with a submittal, please contact DNR staff prior to submitting a document without a fee.

The DNR appreciates your efforts to investigate and remediate this Site. If you have any questions about this letter, please contact me, the DNR Project Manager, at (608) 622-8606 or Alyssa.Sellwood@wisconsin.gov.

Sincerely,



Alyssa Sellwood, PE
Complex Sites Project Manager
Remediation & Redevelopment Program

Attachments: Attachment A – Figures taken from ChemDesign’s reports to DNR
Attachment B – City of Marinette PFAS sampling results for ChemDesign industrial wastewater

cc: Tom Willis, ChemDesign (via email: twillis@chemdesign.com)
Ed Buc, Terracon (via email: eabuc@terracon.com)
Bridget Kelly, DNR (via email: bridgetb.kelly@wisconsin.gov)
Jodie Peotter, DNR (via email: Jodie.peotter@wisconsin.gov)
Jennifer Pelczar, DNR (via email: Jennifer.Pelczar@wisconsin.gov)

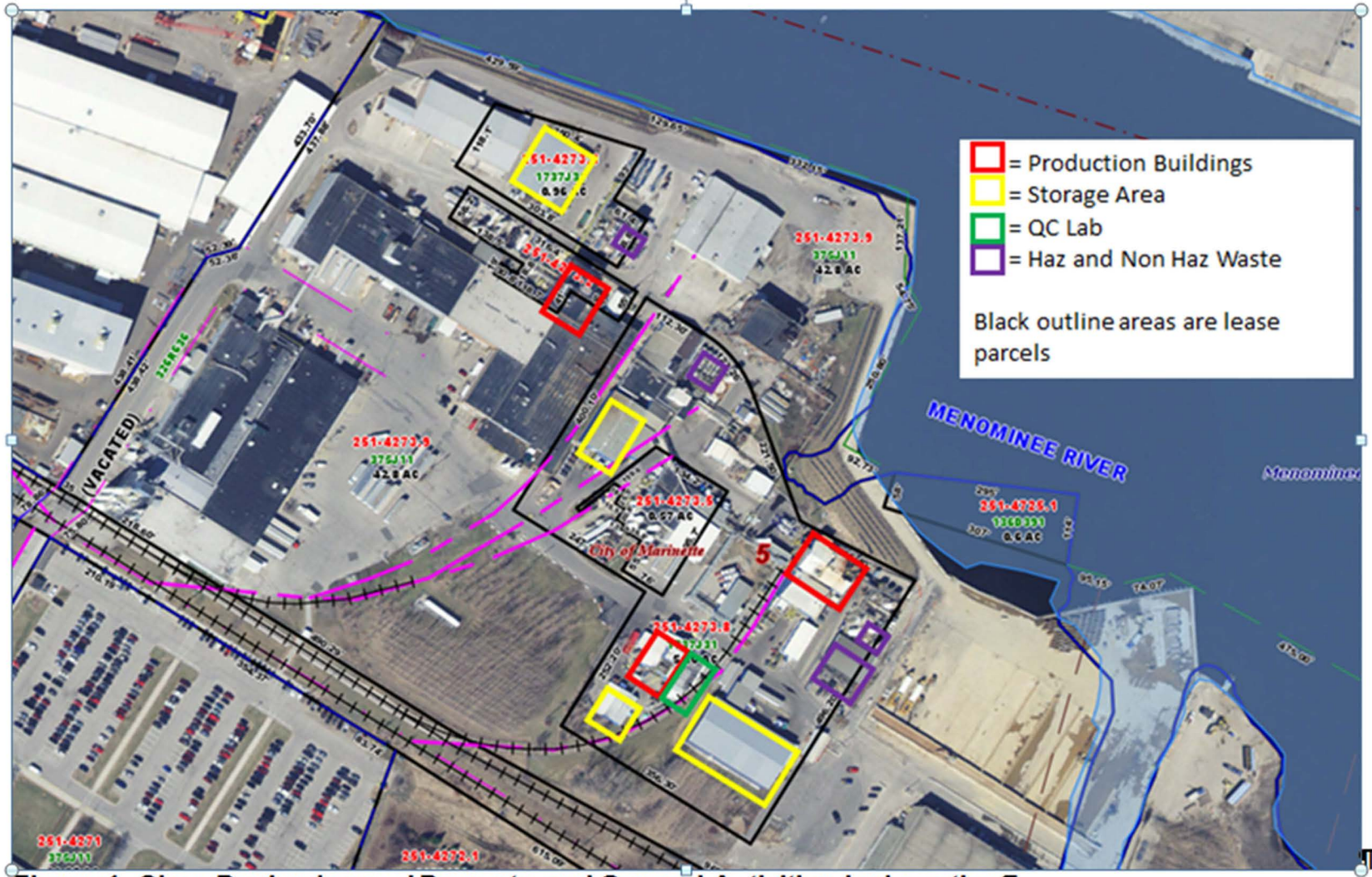


Figure-1. ChemDesign Leased Property and General Activities by Location



LEGEND (ARCADIS)

△	PROPOSED AIR SAMPLE	---	SHEET PILE WALL
⊕	PROPOSED BORING/TEMPORARY WELL	-.-	SLURRY WALL
⊙	EXTRACTION WELL OR TEST WELL	▨	PROPERTY LEASED BY CHEMDESIGN
⊕	MONITORING WELL - SHALLOW OR PEAT	⊙	BUILDING NUMBERS
⊕	MONITORING WELL - MEDIUM		
⊕	MONITORING WELL - DEEP (BEDROCK)		

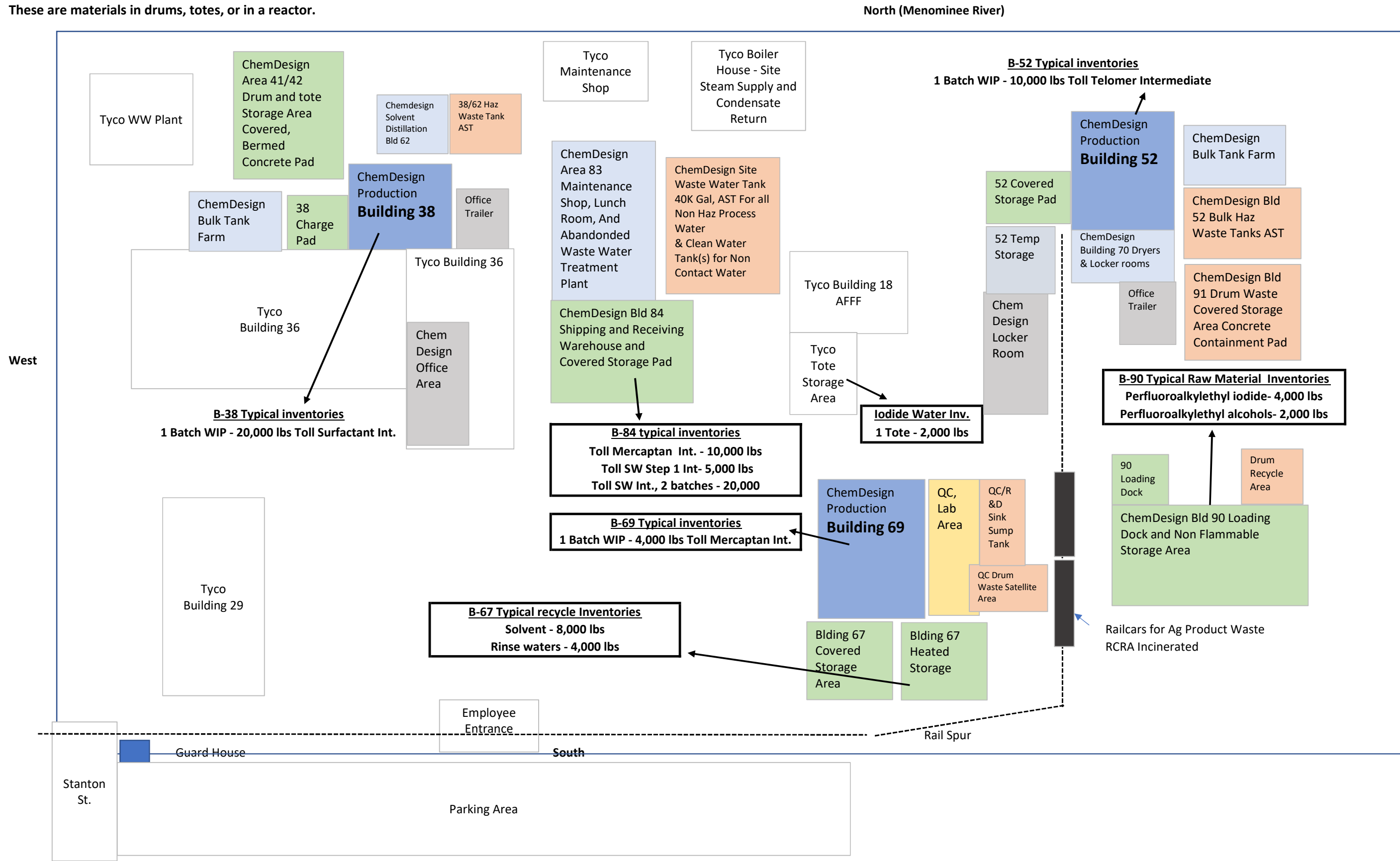
130 0 130
 APPROXIMATE SCALE: 1" = 130'
 ARCADIS SYMBOLS AND LOCATIONS ARE PROVIDED BY CLIENT
 IMAGE SOURCE: GOOGLE EARTH PRO
 DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mngr:	EAB	Project No.:	58197143
Drawn By:	JLM (41)	Scale:	AS SHOWN
Checked By:	EAB	File No.:	58197143C1
Approved By:	BRS	Date:	5/2021

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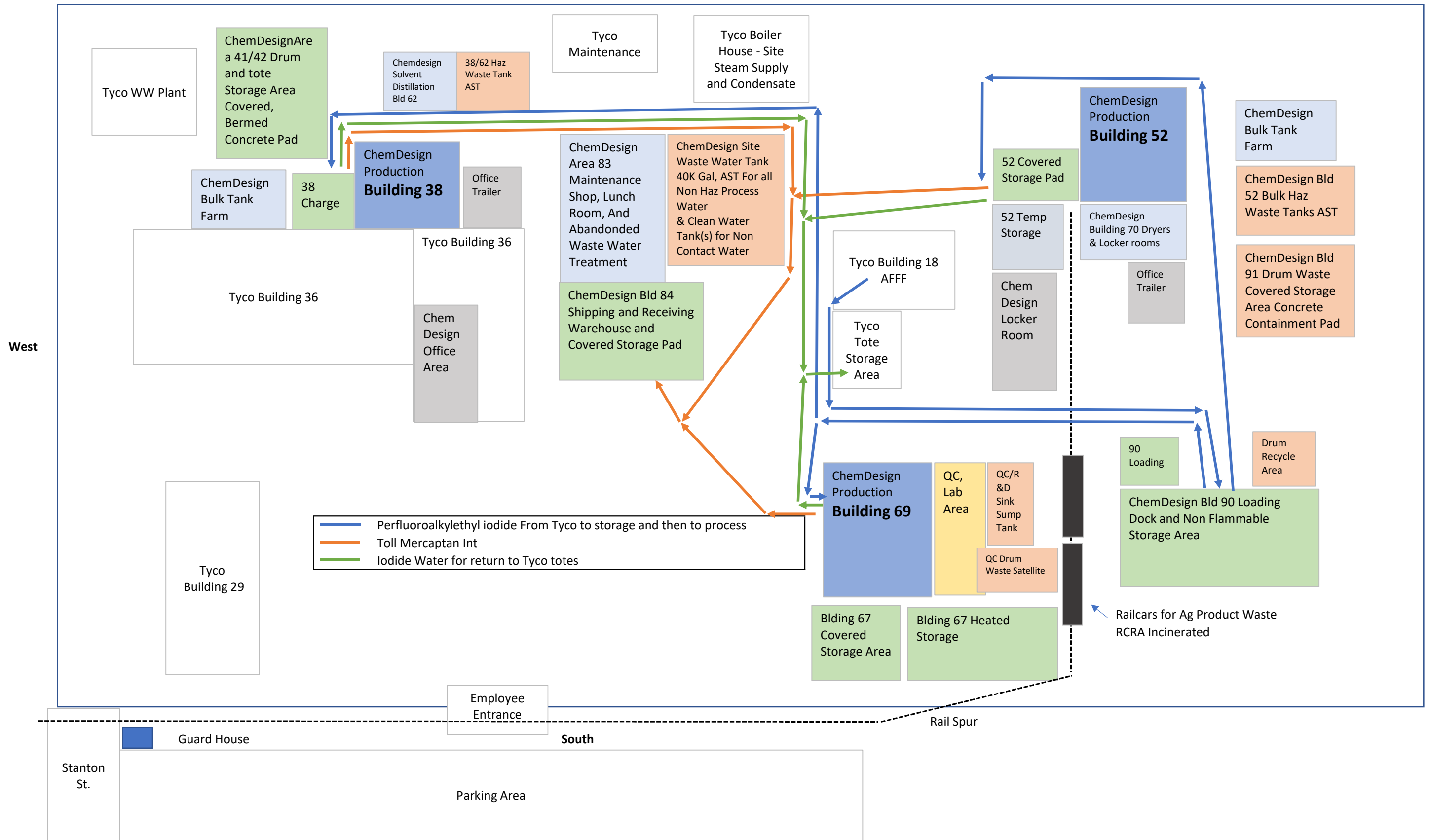
CHEMDESIGN - LEASED PROPERTY
 CHEMDESIGN PRODUCTS, INC
 2 STANTON STREET
 MARINETTE, WISCONSIN

Attachment 1.1: ChemDesign General Site Map with Inventory locations BRRTS 02-38-583852
Typical Inventories Excludes any Tyco/Chemguard Inventories, WIP Refers to Work in Progress Materials
These are materials in drums, totes, or in a reactor.



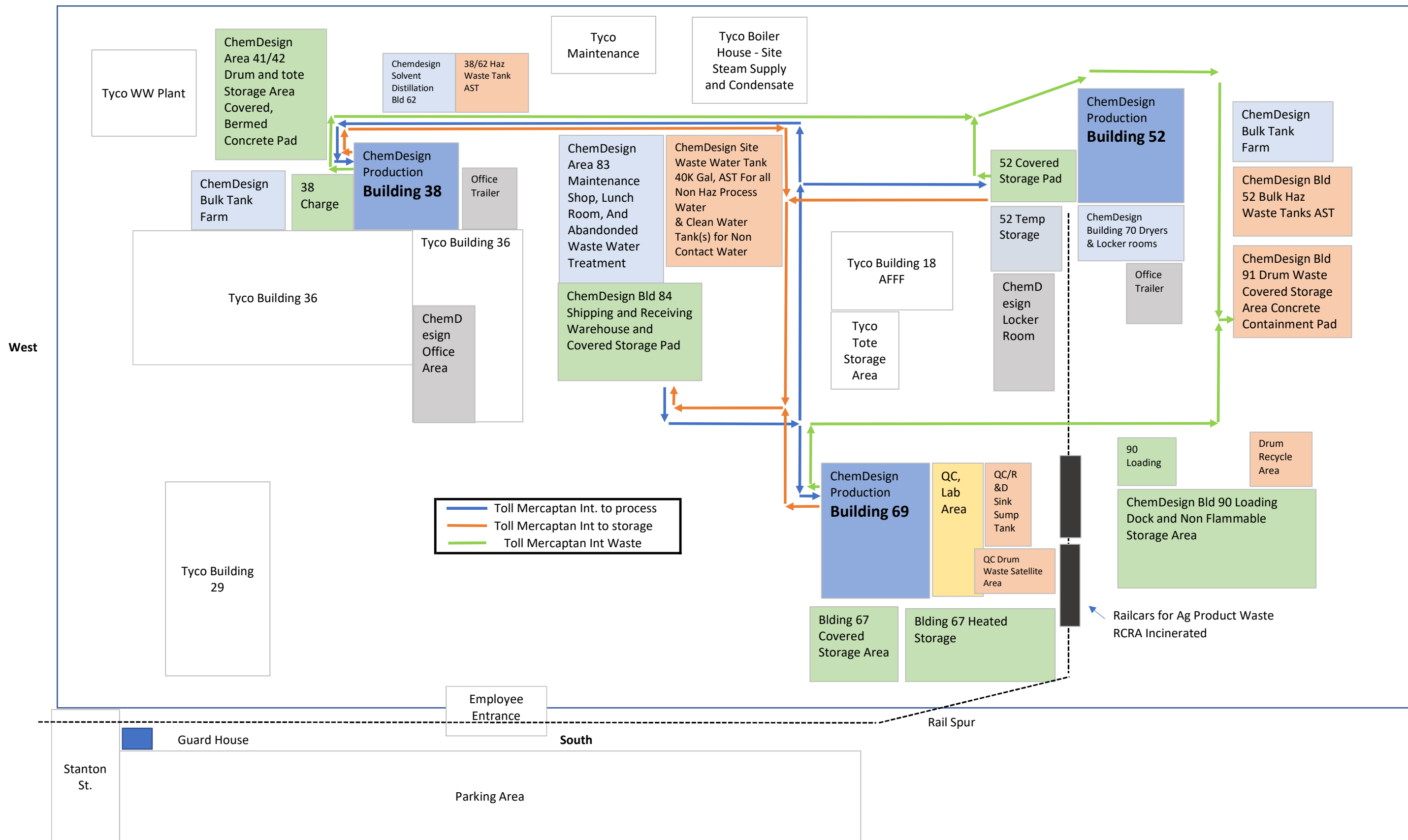
Attachment 1.2: ChemDesign Site Map Toll Mercaptan Intermediate Traffic BRRTS 02-38-583852

North (Menominee River)



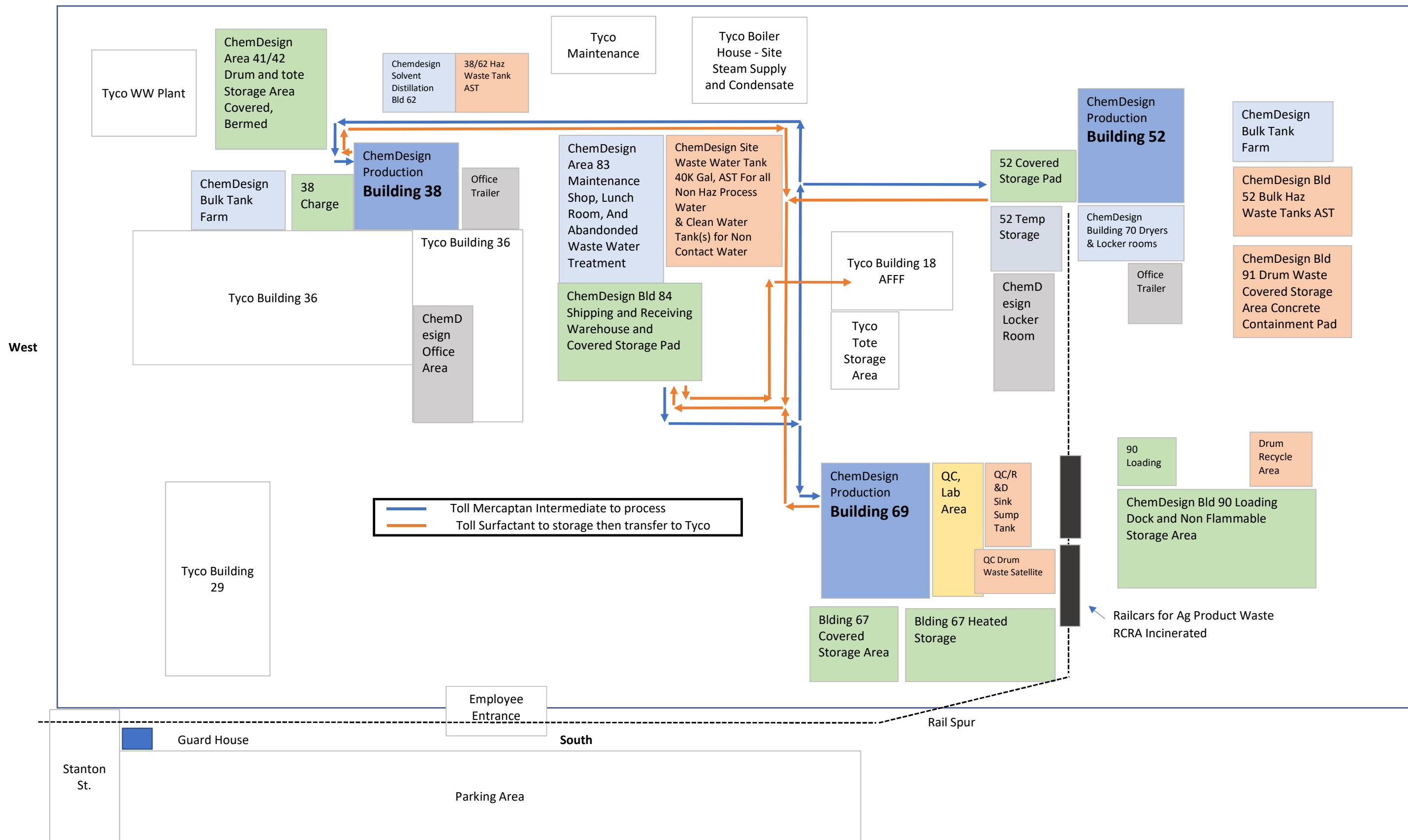
Attachment 1.3: ChemDesign Site Map Toll Mercaptan Distillation Traffic BRRTS 02-38-583852

North (Menominee River)



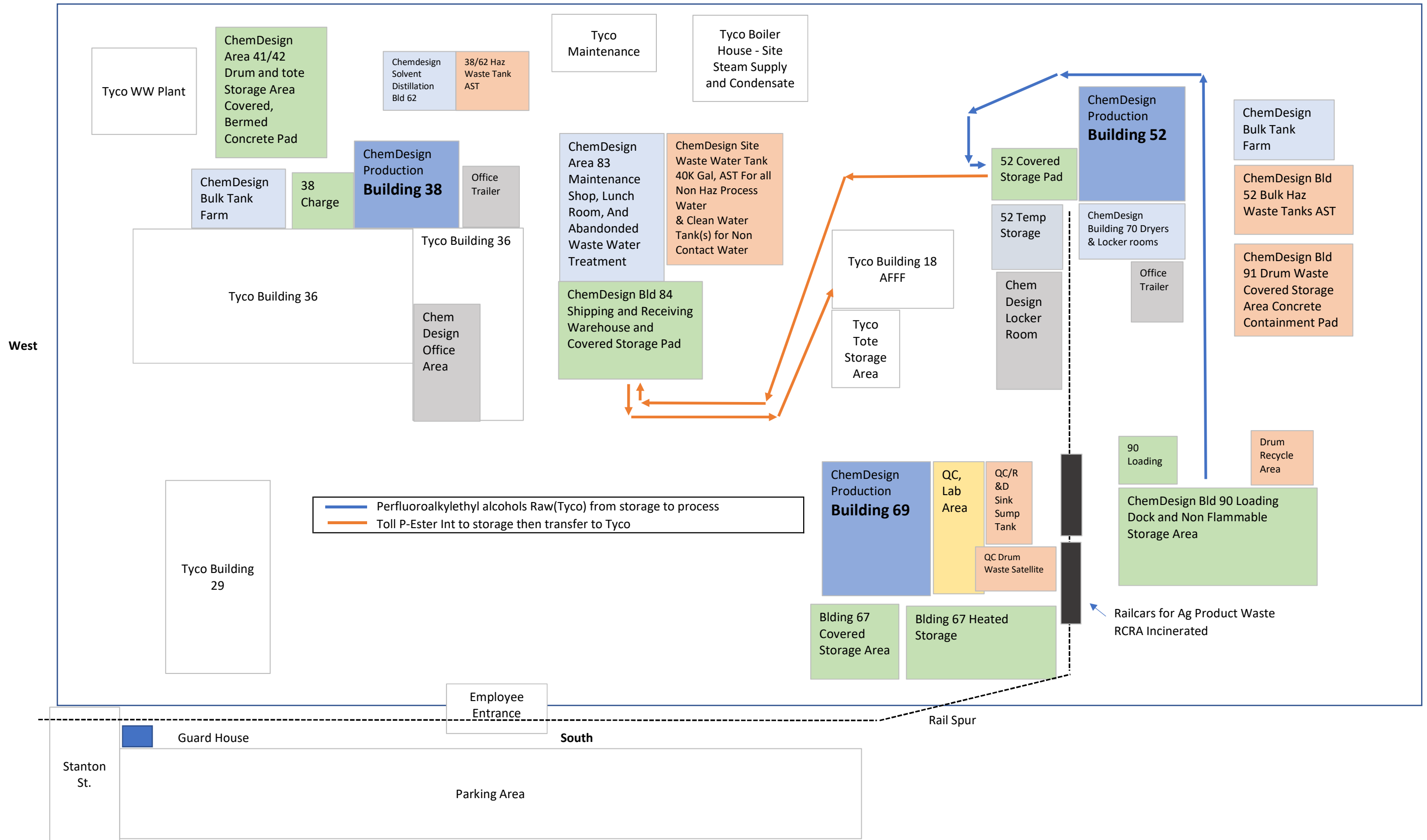
Attachment 1.4: ChemDesign Site Map Toll Surfactant Intermediate Traffic BRRTS 02-38-583852

North (Menominee River)

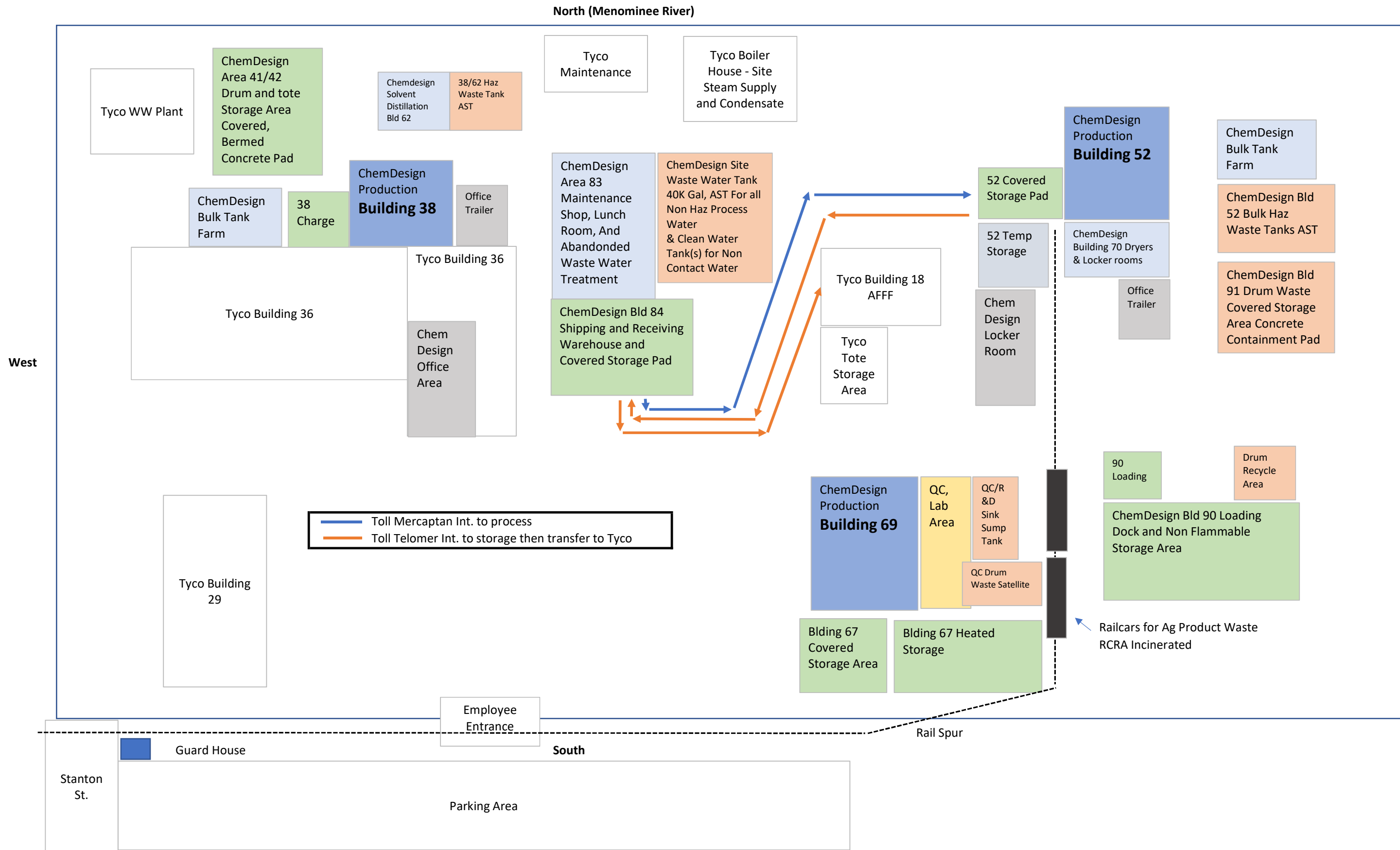


Attachment 1.5: ChemDesign Site Map Toll P-Ester Traffic BRRTS 02-38-583852

North (Menominee River)

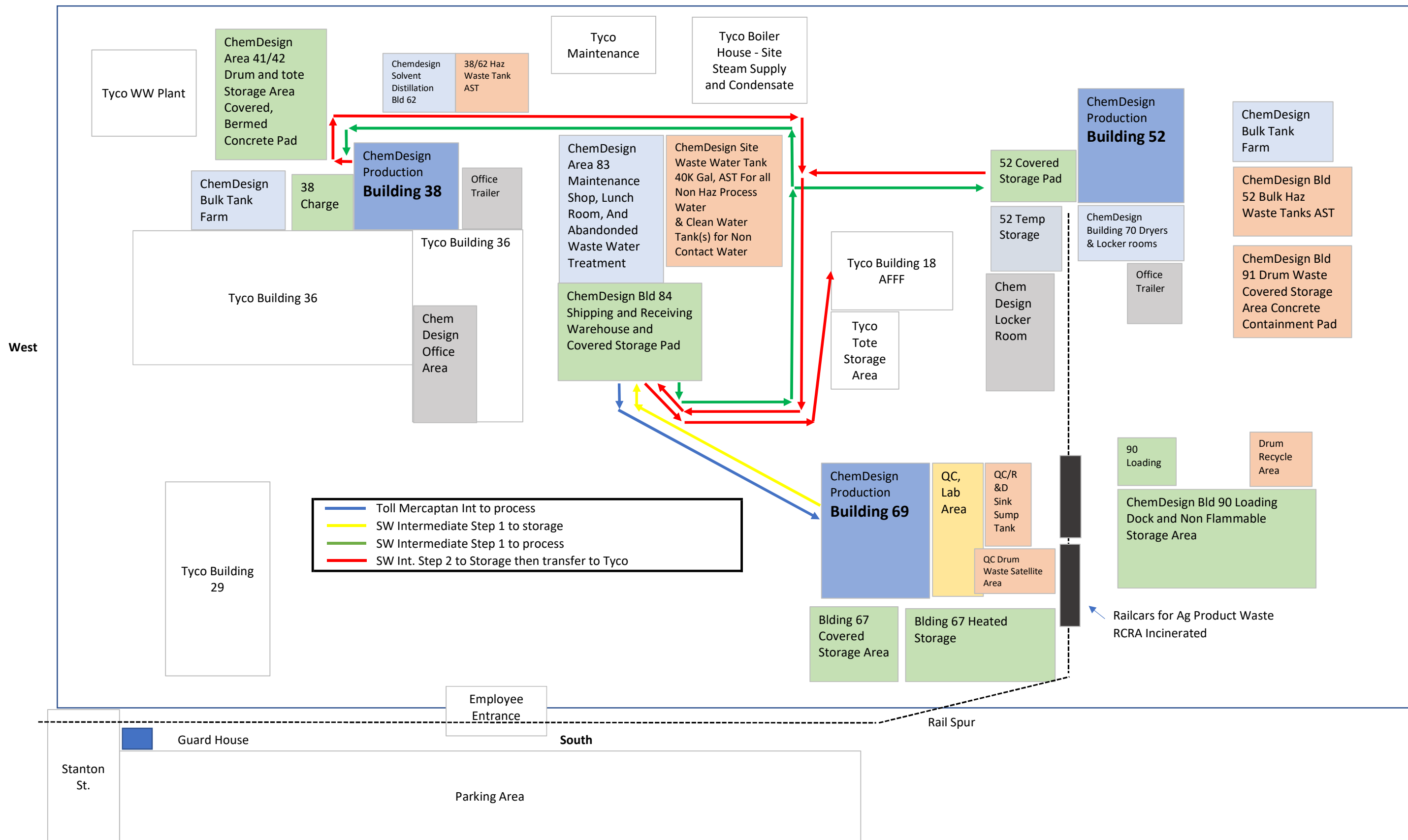


Attachment 1.6: ChemDesign Site Map Toll Telomer Int Traffic BRRTS 02-38-583852

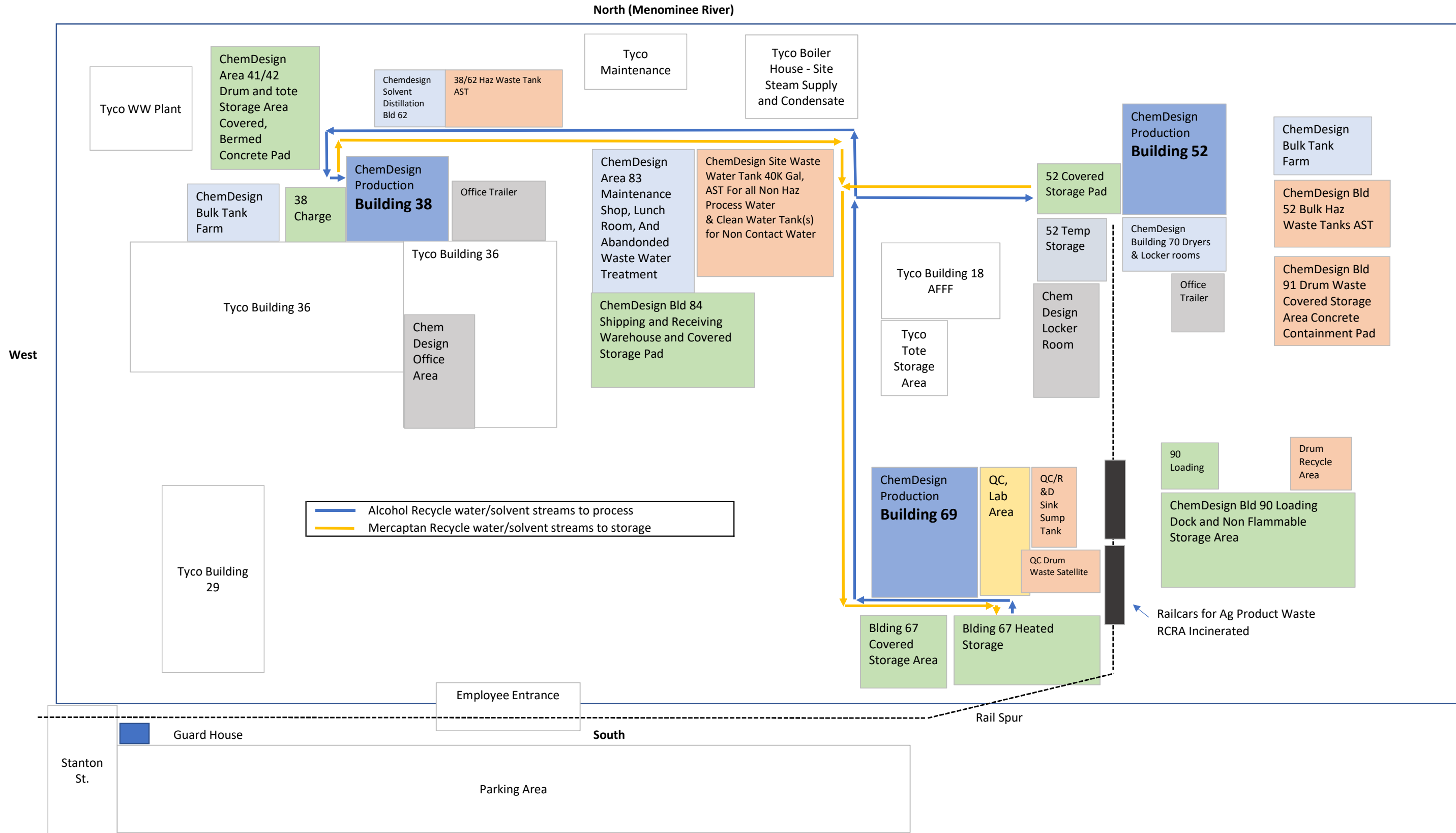


Attachment 1.7: ChemDesign Site Map Toll SW Intermediate Traffic BRRTS 02-38-583852

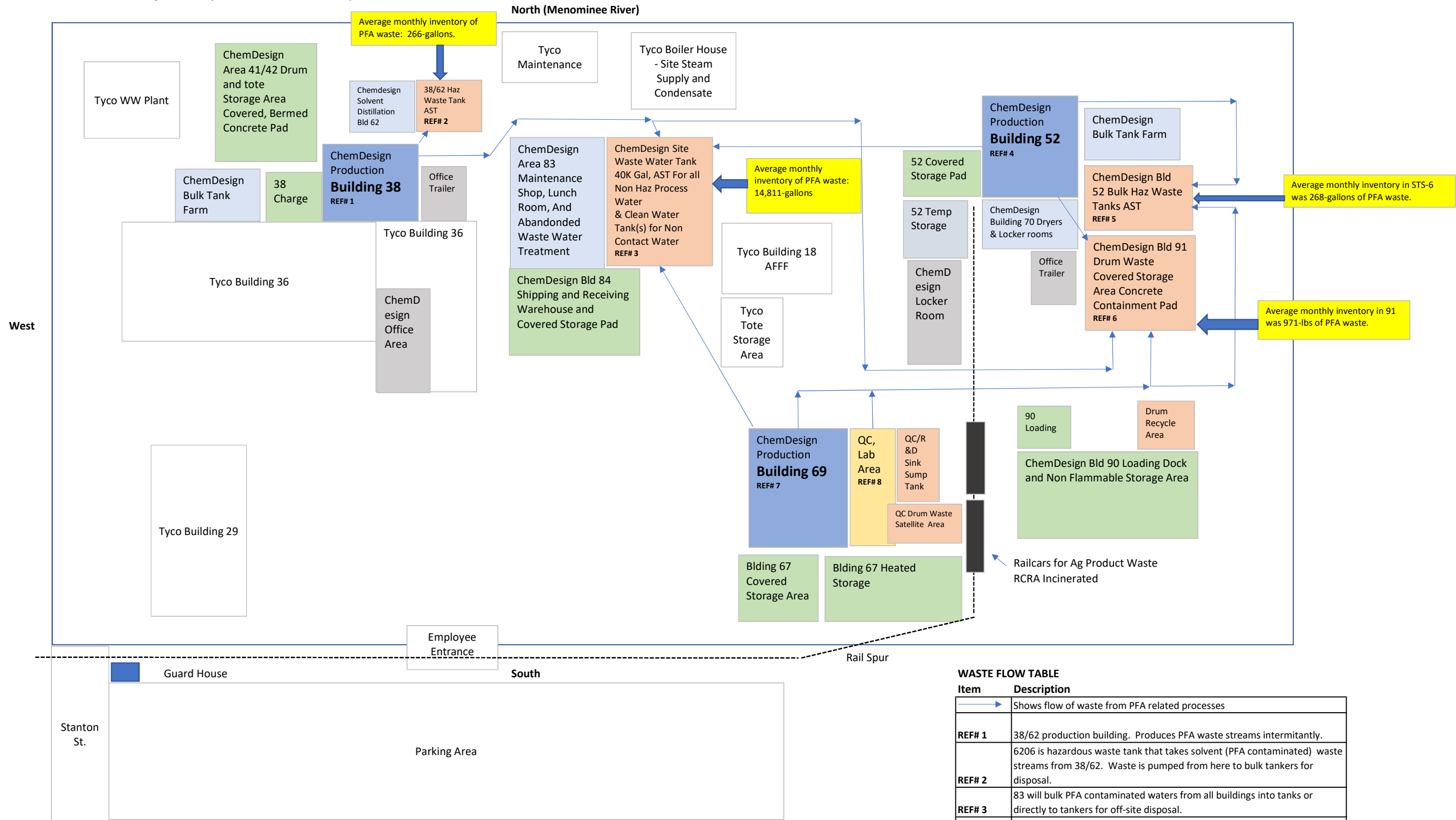
North (Menominee River)



Attachment 1.8: ChemDesign Site Map Recycle Materials Traffic BRRTS 02-38-583852



Attachment 1.9: ChemDesign Site Map Process Waste Inventory Traffic BRRTS 02-38-583852



WASTE FLOW TABLE

Item	Description
→	Shows flow of waste from PFA related processes
REF# 1	38/62 production building. Produces PFA waste streams intermitantly.
REF# 2	6206 is hazardous waste tank that takes solvent (PFA contaminated) waste streams from 38/62. Waste is pumped from here to bulk tankers for disposal.
REF# 3	83 will bulk PFA contaminated waters from all buildings into tanks or directly to tankers for off-site disposal.
REF# 4	52 production building. Produces PFA waste streams intermitantly.
REF# 5	STS-6 is hazardous waste tank that takes solvent (PFA contaminated) waste streams from 52/70/69 and the labs. Waste is pumped from here to bulk tankers for disposal.
REF# 6	91 is the drummed hazardous waste storage. It will take sample and contaminated (PFA) material waste from all production buildings and the labs.
REF# 7	69 production building. Produces PFA waste streams intermitantly.
REF# 8	QC/ R&D labs. Produces PFA waste streams intermitantly.

Attachment B: City of Marinette PFAS Sampling Results for ChemDesign Industrial Wastewater

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July, 2020 Update

Subject: PFOA and PFOS Investigation

As part of the ongoing investigation of PFOA and PFOS contamination in the City of Marinette Sanitary Sewer System, Wastewater Utility Staff collected samples directly from industries, designated collection system manhole locations, and Wastewater Treatment Plant Influent and Effluent previously sampled in this PFOA and PFOS investigation. The results of the investigative sampling are listed in the tables below.

Wastewater Analysis:

Industrial Sewer Sampling

Sample Location	Sample Date	PFOA (ppt)	PFOS (ppt)
Tyco/JCI Industrial Parkway South Wastewater	12-6-2018	253	3670
Tyco/JCI Stanton Street Wastewater	12-6-2018	116	7.1
ChemDesign Wastewater	12-6-2018	1120	48.3
Tyco/JCI Industrial Parkway South Wastewater	1-29-2020	28.4	71.8
Tyco/JCI Stanton Street Wastewater	1-29-2020	34	3.91
ChemDesign Wastewater	1-29-2020	1980	50.7
Tyco/JCI Industrial Parkway South Wastewater	6-18-2020	20	18
Tyco/JCI Stanton Street Wastewater	6-18-2020	14	2.6
ChemDesign Wastewater	6-18-2020	3700	<46

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Treatment Plant Influent and Effluent Sampling

Sample Location	Sample Date	PFOA (ppt)	PFOS (ppt)
Wastewater Influent	11-20-2017	34.3	9.28
Wastewater Effluent	11-20-2017	38.2	42.8
Wastewater Influent	5-14-2018	43.5	25.4
Wastewater Effluent	5-14-2018	50.3	13.3
Wastewater Influent	10-30-2019	28	[3.8]
Wastewater Effluent	10-30-2019	37	5.4
Wastewater Influent	6-18-2020	28	8.4
Wastewater Effluent	6-18-2020	38	9.3

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.