# PARALLEL PRODUCTS OF NEW ENGLAND, INC.

## Draft Environmental Impact Report
## Part 2 of 2

EEA # 15990

100 Duchaine Boulevard
New Bedford, Massachusetts 02745

**November 2019**

**Prepared For:**

Parallel Products of New England, Inc.
100 Duchaine Boulevard
New Bedford, Massachusetts 02745

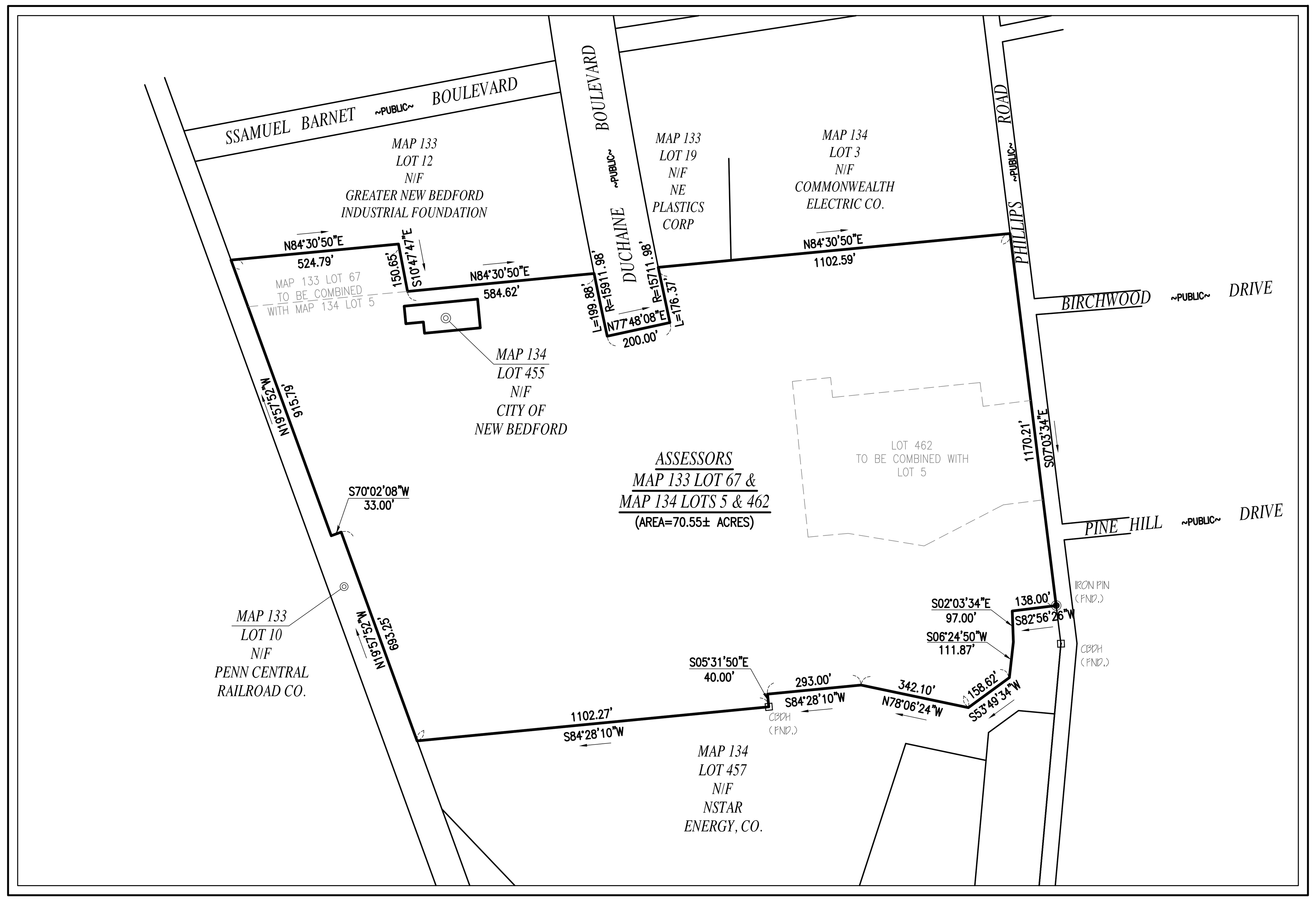
Green Seal Environmental, Inc.

114 State Road, Building B, Sagamore Beach, MA 02562 | Tel: (508) 888-6034 | Fax: (508) 888-1506 | www.gseenv.com

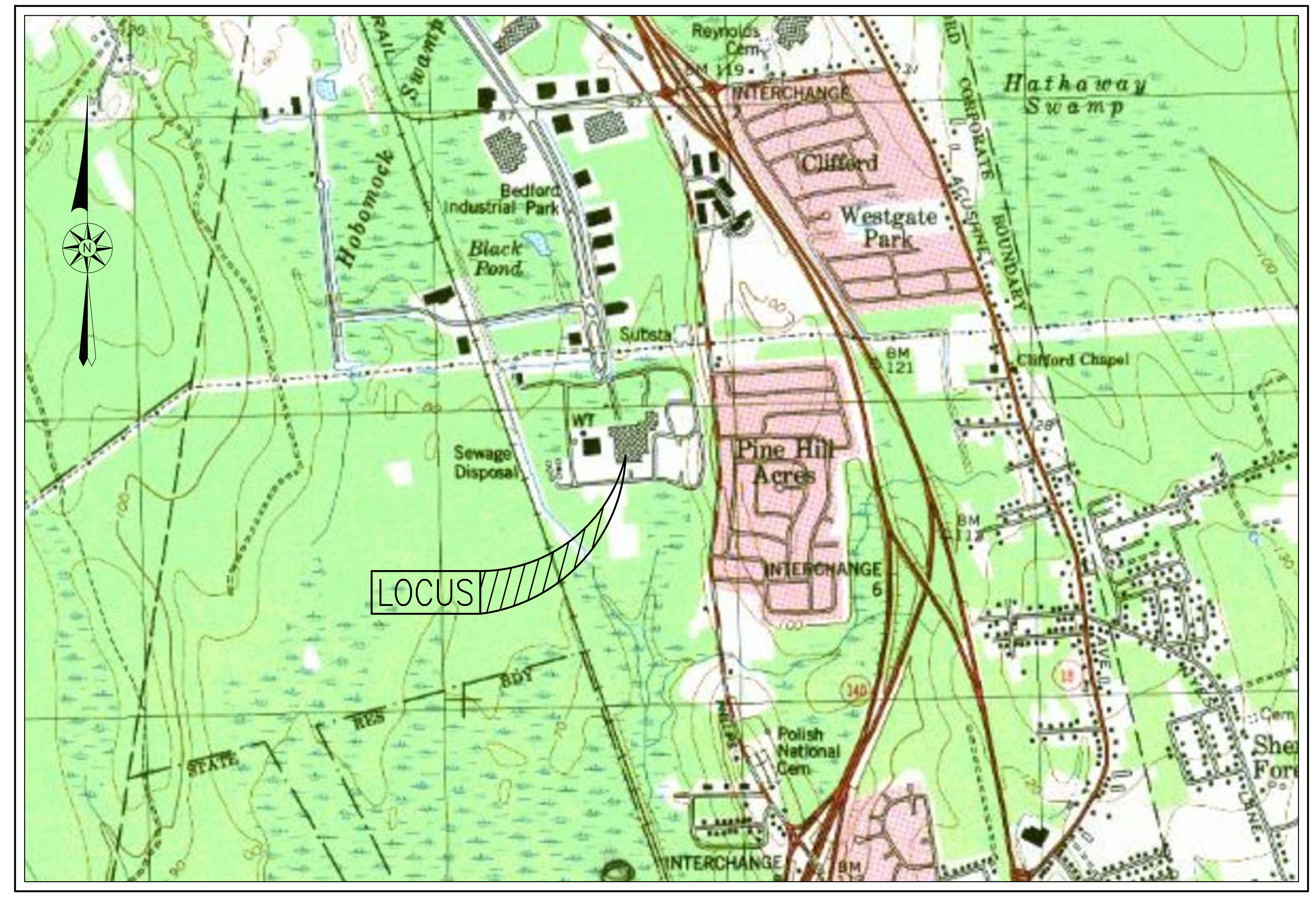
ATTACHMENT 8

PROJECT PLANS

# PHASE I & PHASE II
# SITE PLAN
## 100 DUCHAINE BOULEVARD
## ASSESSORS MAP 133 LOT 67 AND MAP 134 LOTS 5 & 462
## NEW BEDFORD, MASSACHUSETTS




## — OVERALL SITE MAP —
SCALE: 1"=300'




## — AREA MAP —
SCALE: 1"=1,000'±

### — INDEX —



### — ZONING DATA —
**DISTRICT:** IC (INDUSTRIAL C)

| DESCRIPTION | REQUIRED | EXISTING | PROVIDED |
|---|---|---|---|
| LOT AREA | 0 S.F. | 61.96± AC | 70.55± AC |
| LOT FRONTAGE | 0 FT | 576.17 FT | 576.17 FT |
| FRONT SETBACK | 25 FT | 642.3± FT | 582.0± FT |
| SIDE SETBACK | 25 FT | 758.9± FT | 674.9± FT |
| REAR SETBACK | 25 FT | 192.3± FT | 86.8± FT |
| BUILDING HEIGHT (MAXIMUM) | 100 FT | <100 FT | <100 FT |
| BUILDING COVERAGE (MAXIMUM) | 50 % | 4.0± % | 6.8± % |
| LOT COVERAGE (MAXIMUM) | 80 % | 22.9± % | 25.8± % |

### — PARKING & LOADING REQUIREMENTS —
**PRINCIPAL USE:** RECYCLING FACILITY
**(FOR PARKING REGULATION PURPOSES: BUSINESS ENGAGED IN WAREHOUSING & DISTRIBUTION)**

| REQUIREMENT | REQURIED | PROVIDED |
|---|---|---|
| 1 SPACE PER 1,500 S.F. OF G.F.A. UP TO 15,000 S.F. THEREAFTER, ONE ADDITIONAL SPACE FOR EACH 5,000 S.F. OR PORTION THEREOF IN EXCESS OF 15,000 S.F., PLUS ONE SPACE FOR EACH VEHICLE UTILIZED IN THE BUSINESS. | 47 STANDARD SPACES PLUS FLEET VEHICLES | 189 TOTAL SPACES |
| WHEN 26–50 TOTAL PARKING SPACES ARE REQUIRED, 2 MUST BE ACCESSIBLE SPACES. ONE IN EVERY EIGHT ACCESSIBLE SPACES, BUT NOT LESS THAN ONE, SHALL BE VAN ACCESSIBLE | 2 TOTAL SPACES (2 VAN) | 2 TOTAL SPACES (2 VAN) |
| TWO (2) LOADING SPACES FOR EACH BUILDING CONTAINING 10,000 S.F. OF GROSS FLOOR AREA. THEREAFTER, ONE (1) ADDITIONAL LOADING SPACE SHALL BE REQUIRED FOR EACH FIFTEEN (15) FEET OF DOCK, PLATFORM, OR OPENING IN THE BUILDING WHERE THE LOADING OR UNLOADING OF COMMODITIES IS INTENDED TO OCCUR. | 18 LOADING SPACES | 20 LOADING SPACES |

**RECORD OWNER:**

REGISTERED:
ASSESSORS MAP 134 LOT 5
SMRE 100, LLC
255 STATE STREET, 7TH FLOOR
BOSTON, MA 02109
L.C. CERTIFICATE No. 24201
LOT 8 ON L.C. PLAN 36318D

ASSESSORS MAP 134 LOT 462
SMRE SUBLOT 20 LLC
401 INDUSTRY ROAD – SUITE 100
LOUSIVILLE, KY 40208
L.C. CERTIFICATE No. 24417
LOT 7 ON L.C. PLAN 36318D

UNREGISTERED:
ASSESSORS MAP 133 LOT 67
SMRE 100, LLC
50 DUCHAINE BOULEVARD
NEW BEDFORD, MA 02745
DEED BOOK 12378 PAGE 314
PARCEL B ON PLAN BOOK 177 PAGE 55



REVISIONS

| | | |
|---|---|---|
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COMMONWEALTH OF MASSACHUSETTS
CHRISTIAN ALBERT FARLAND
No. 47544
CIVIL


FARLAND CORP.
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401 COUNTY STREET
NEW BEDFORD, MA 02740
P.508.717.3479
OFFICES IN:
- TAUNTON
- MARLBOROUGH
- WARWICK, RI

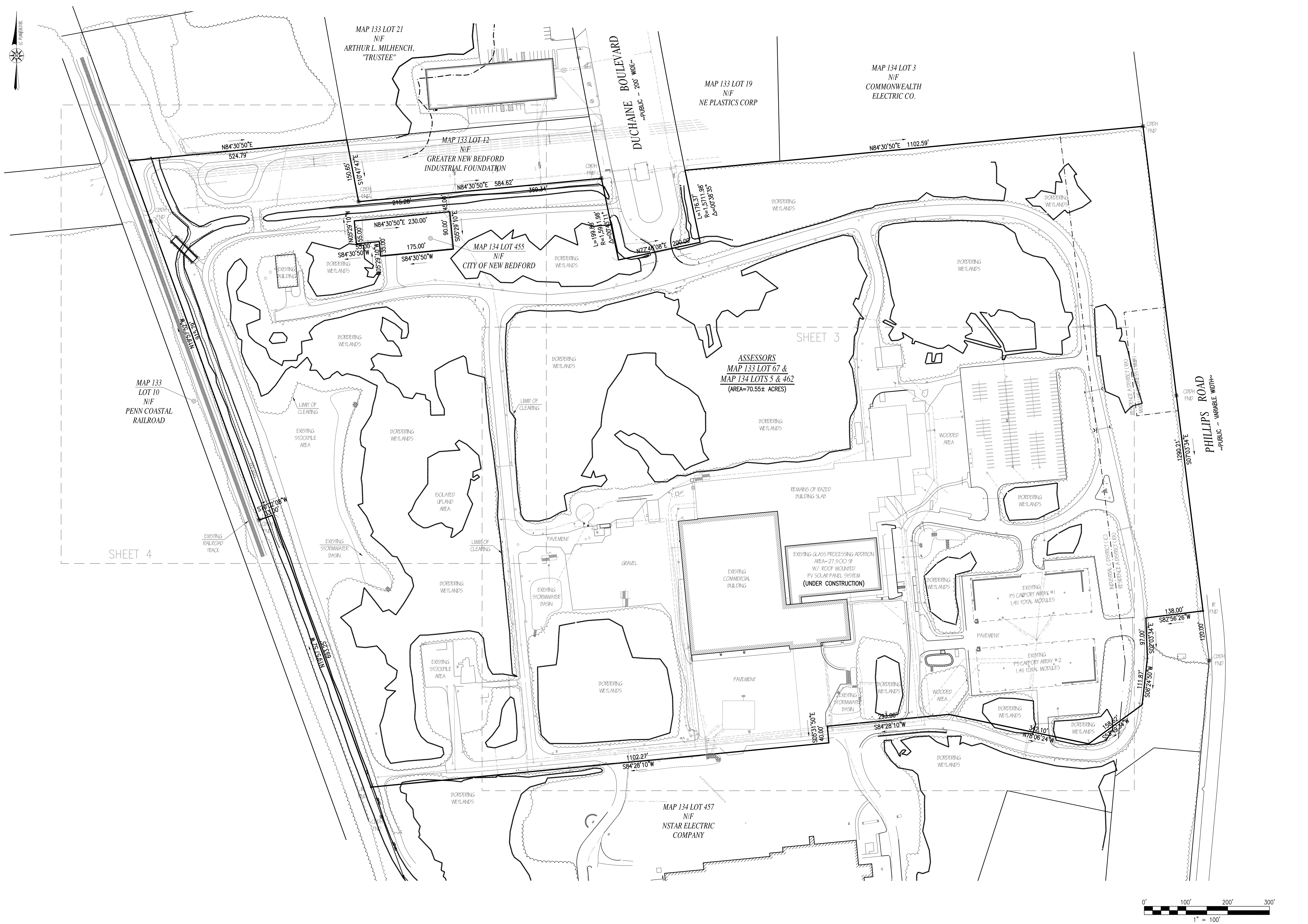

DRAWN BY: MJW
DESIGNED BY: CAF
CHECKED BY: CAF

SITE PLAN
100 DUCHAINE BOULEVARD
ASSESSORS MAP 133 LOT 67
ASSESSORS MAP 134 LOTS 5 & 462
NEW BEDFORD, MASSACHUSETTS

PREPARED FOR:
PARALLEL PRODUCTS OF NEW ENGLAND
401 INDUSTRY ROAD
LOUISVILLE, KY 40208

JULY 3, 2019
SCALE: AS NOTED
JOB NO. 15-500.2
LATEST REVISION: OCTOBER 15, 2019

COVER



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NEW BEDFORD, MASSACHUSETTS

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LOUISVILLE, KY 40208

JULY 3, 2019
SCALE: 1"=100'
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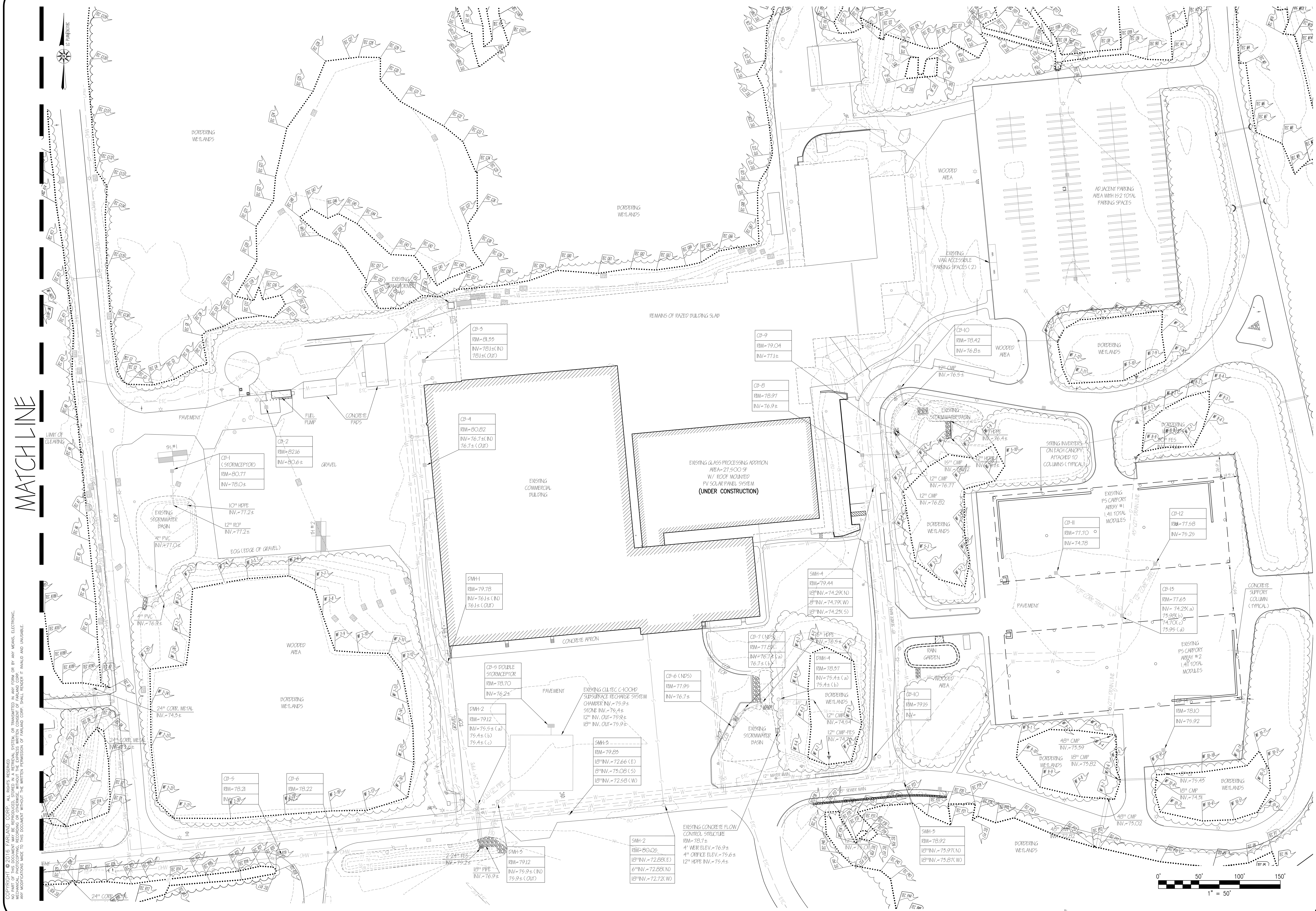
EXISTING CONDITIONS
OVERALL SITE
SHEET 2 OF 26

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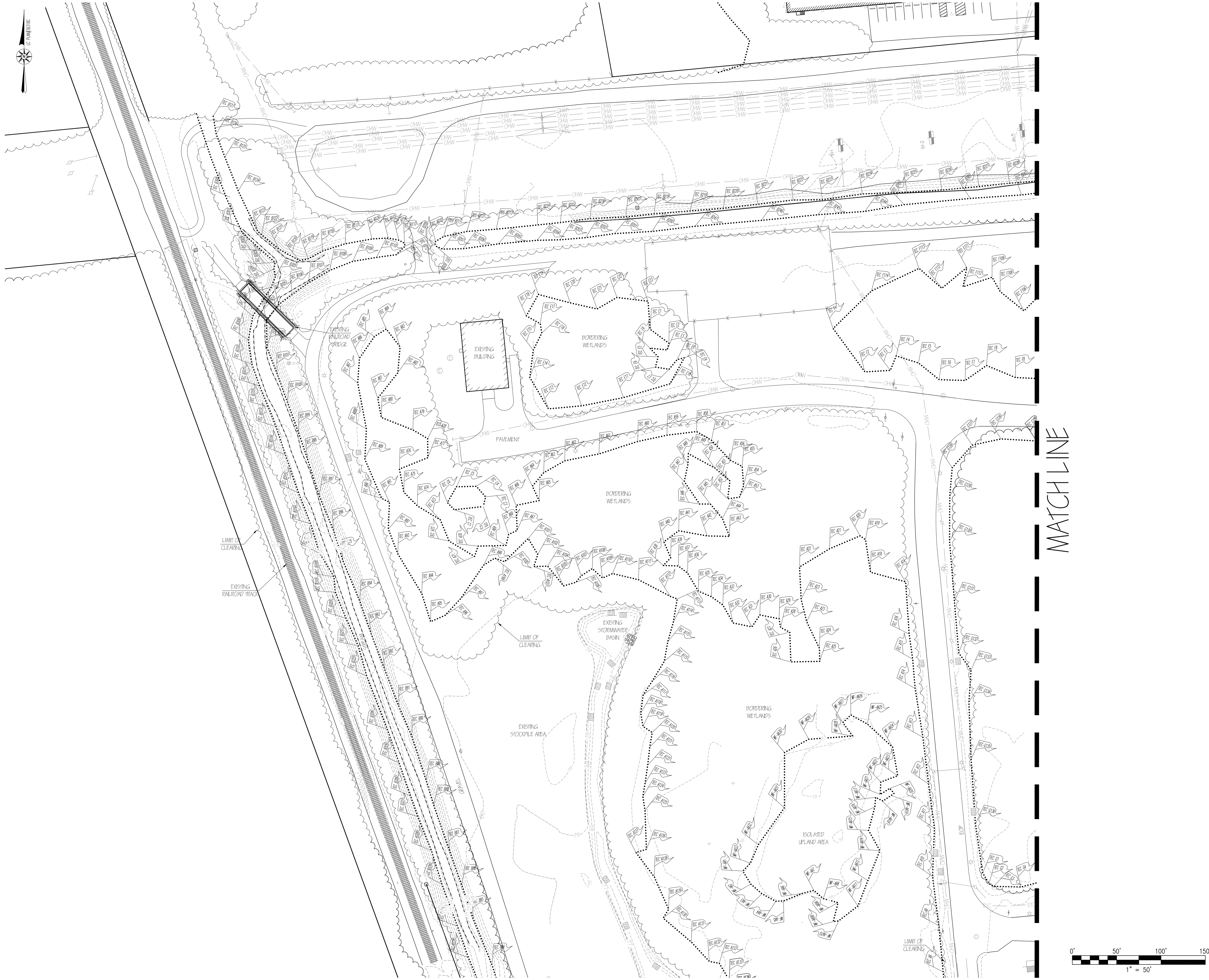
EXISTING CONDITIONS

SHEET 3 OF 26

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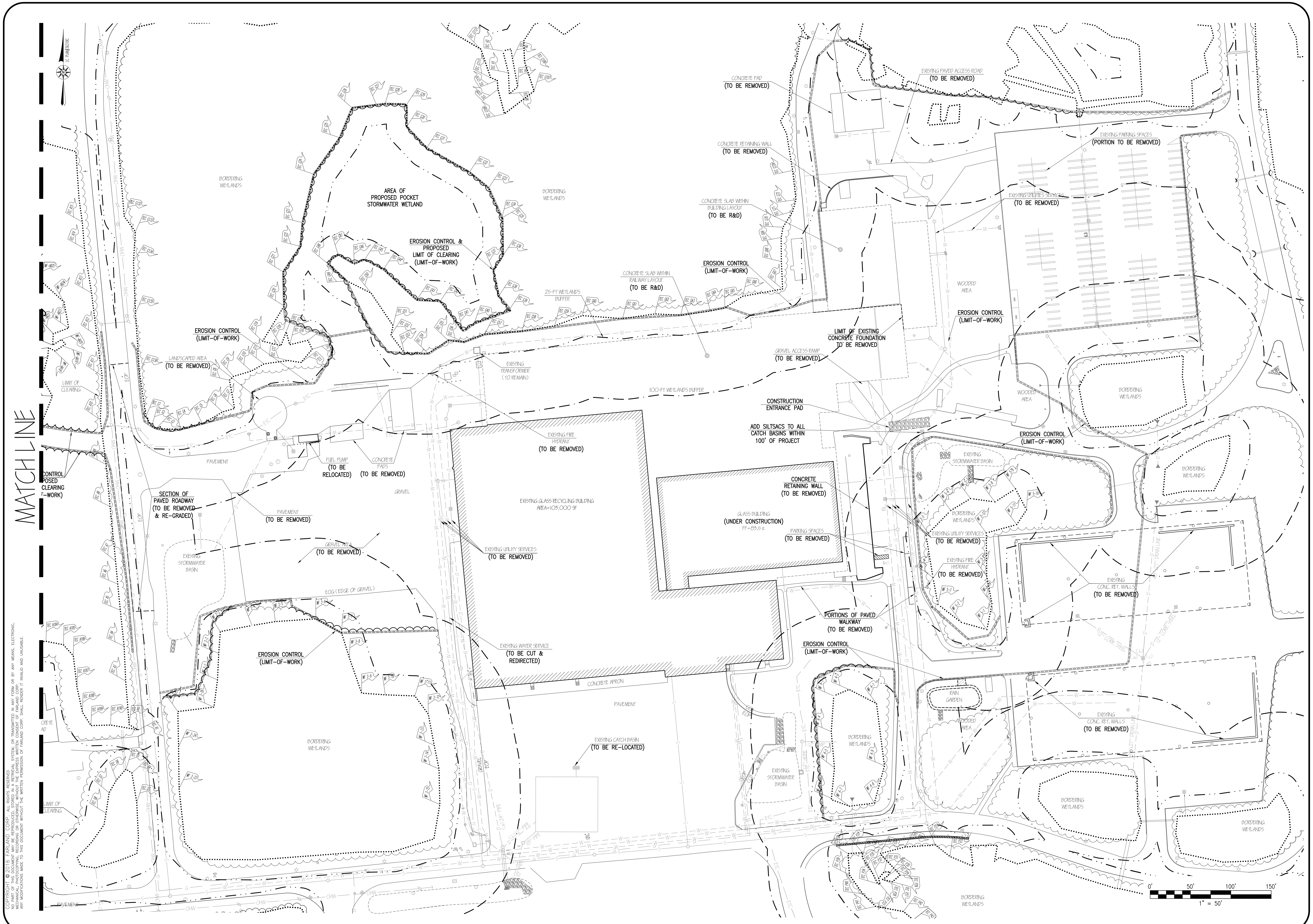



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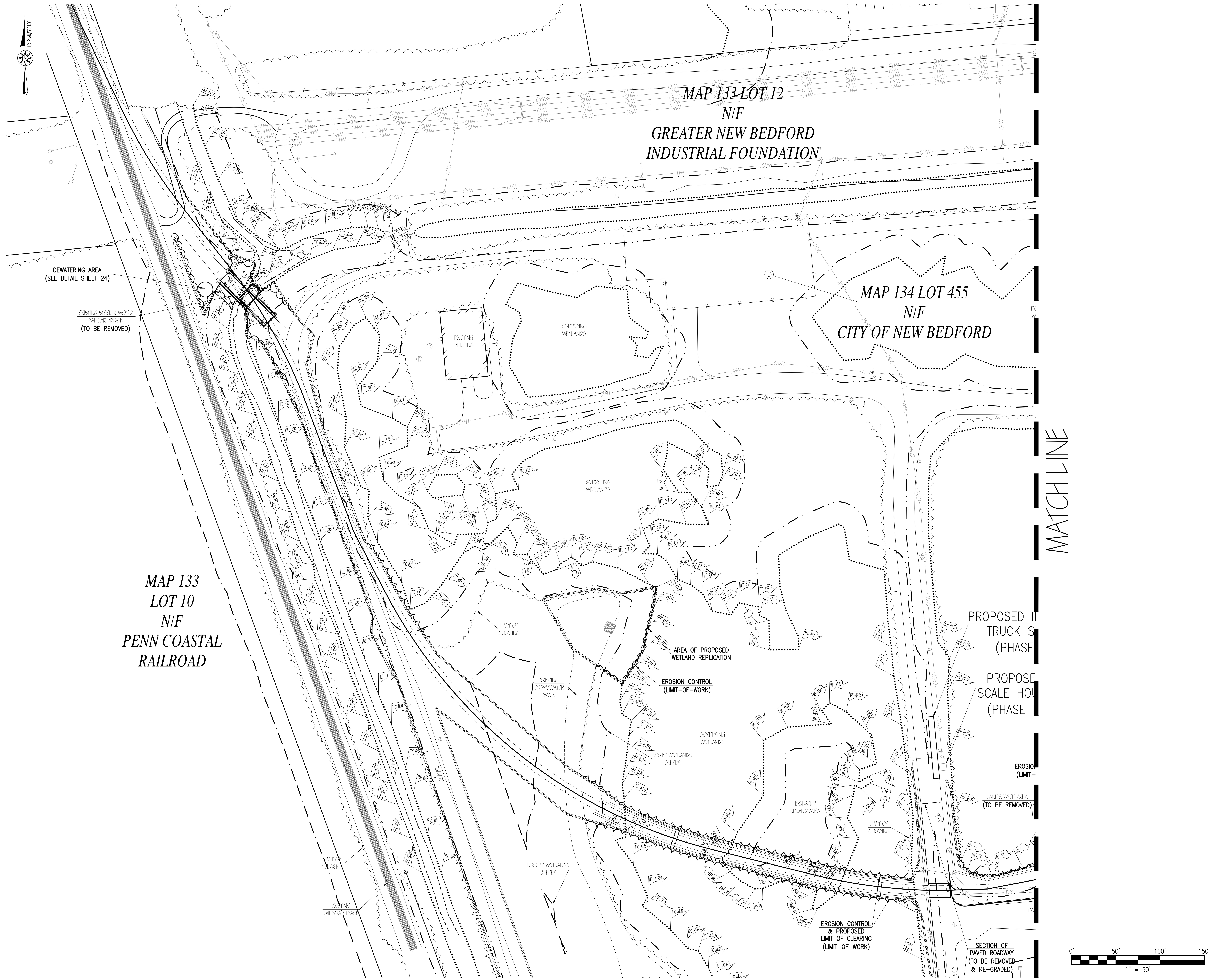
EROSION CONTROL & DEMOLITION
SHEET 5 OF 26

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EROSION CONTROL & DEMO CONT.
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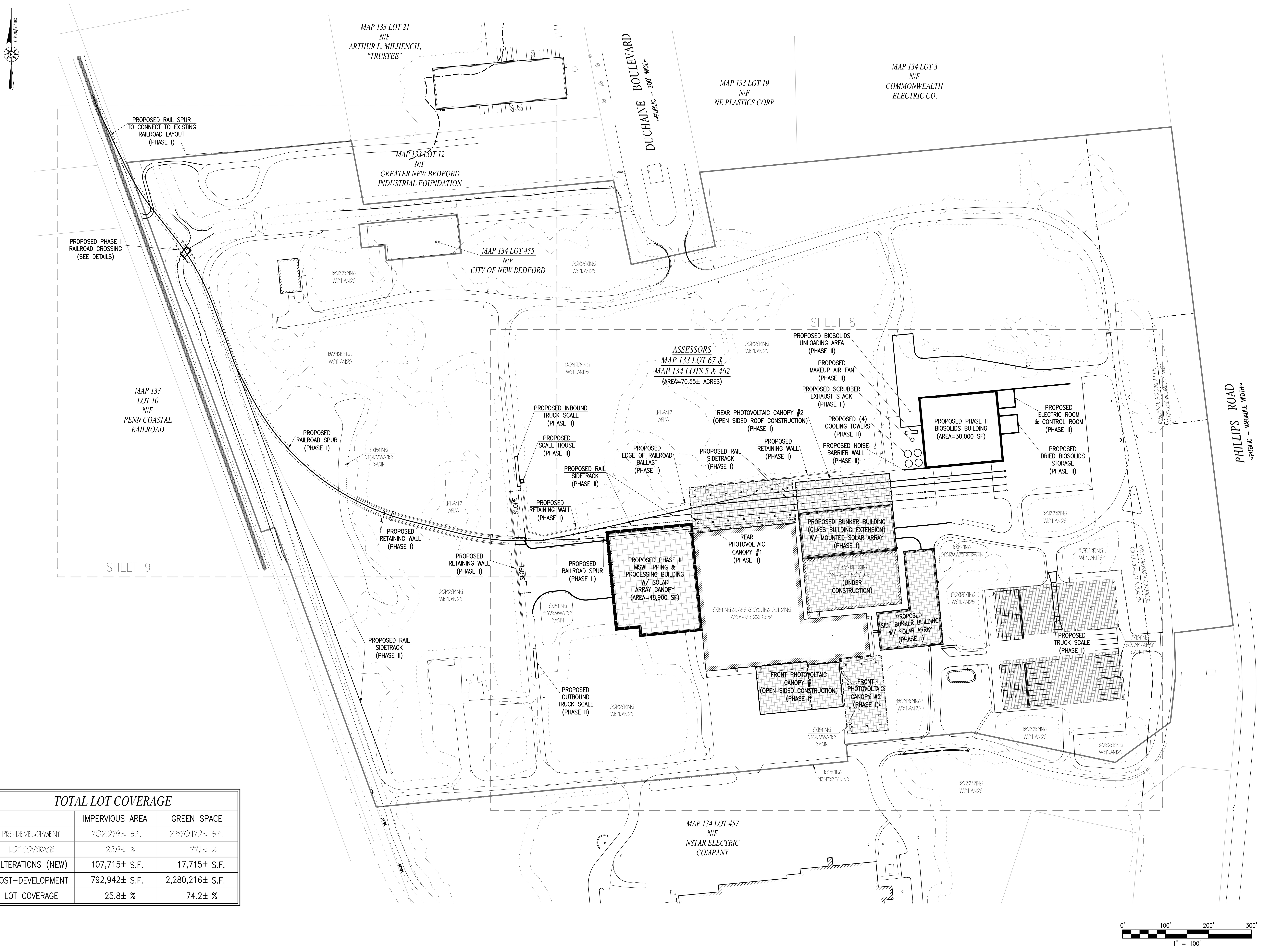


## TOTAL LOT COVERAGE

| | IMPERVIOUS AREA | | GREEN SPACE | |
|---|---|---|---|---|
| PRE-DEVELOPMENT | 702,979± | S.F. | 2,370,179± | S.F. |
| LOT COVERAGE | 22.9± | % | 77.1± | % |
| ALTERATIONS (NEW) | 107,715± | S.F. | 17,715± | S.F. |
| POST-DEVELOPMENT | 792,942± | S.F. | 2,280,216± | S.F. |
| LOT COVERAGE | 25.8± | % | 74.2± | % |



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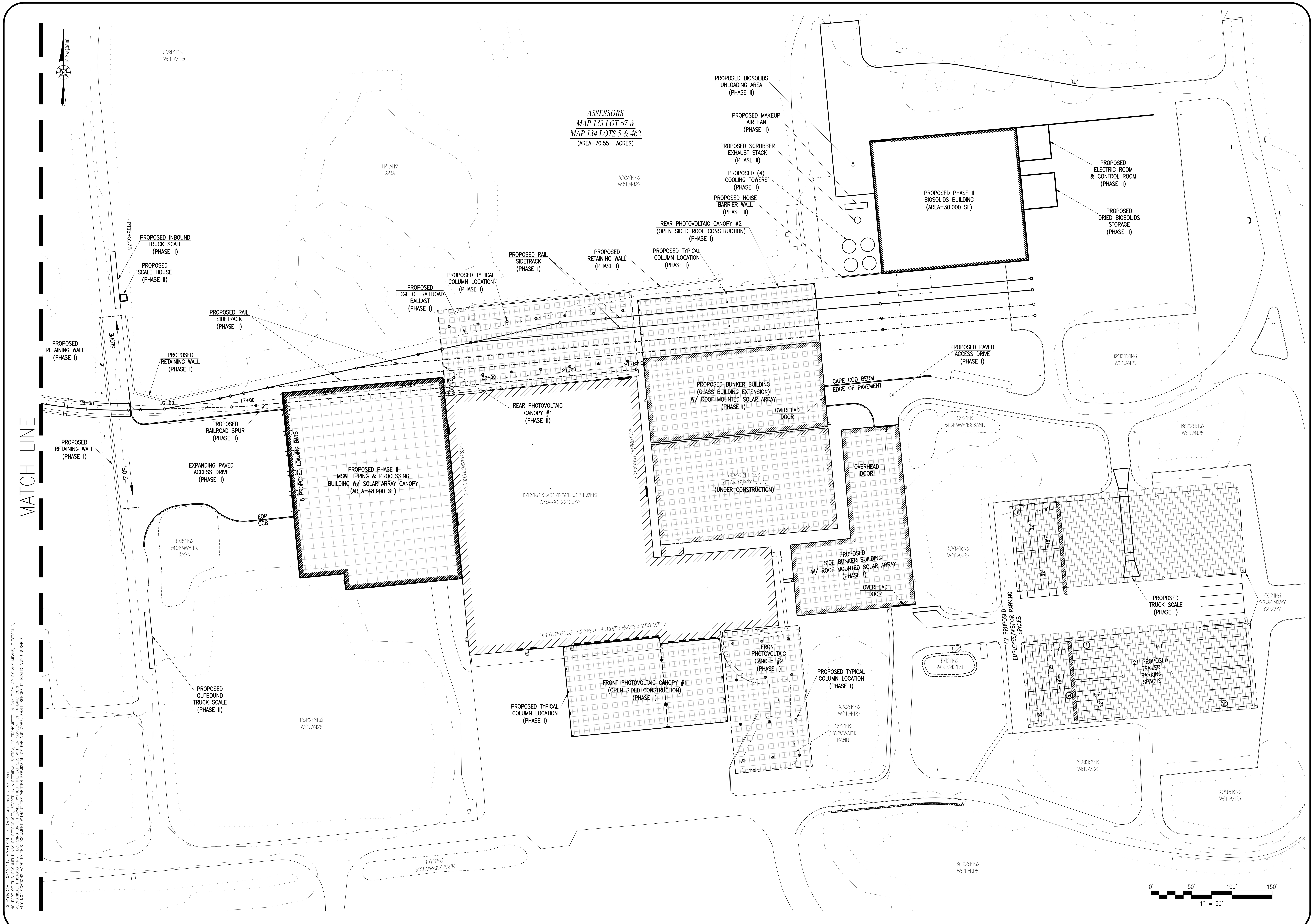
LAYOUT
OVERALL SITE



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LAYOUT

SHEET 8 OF 26




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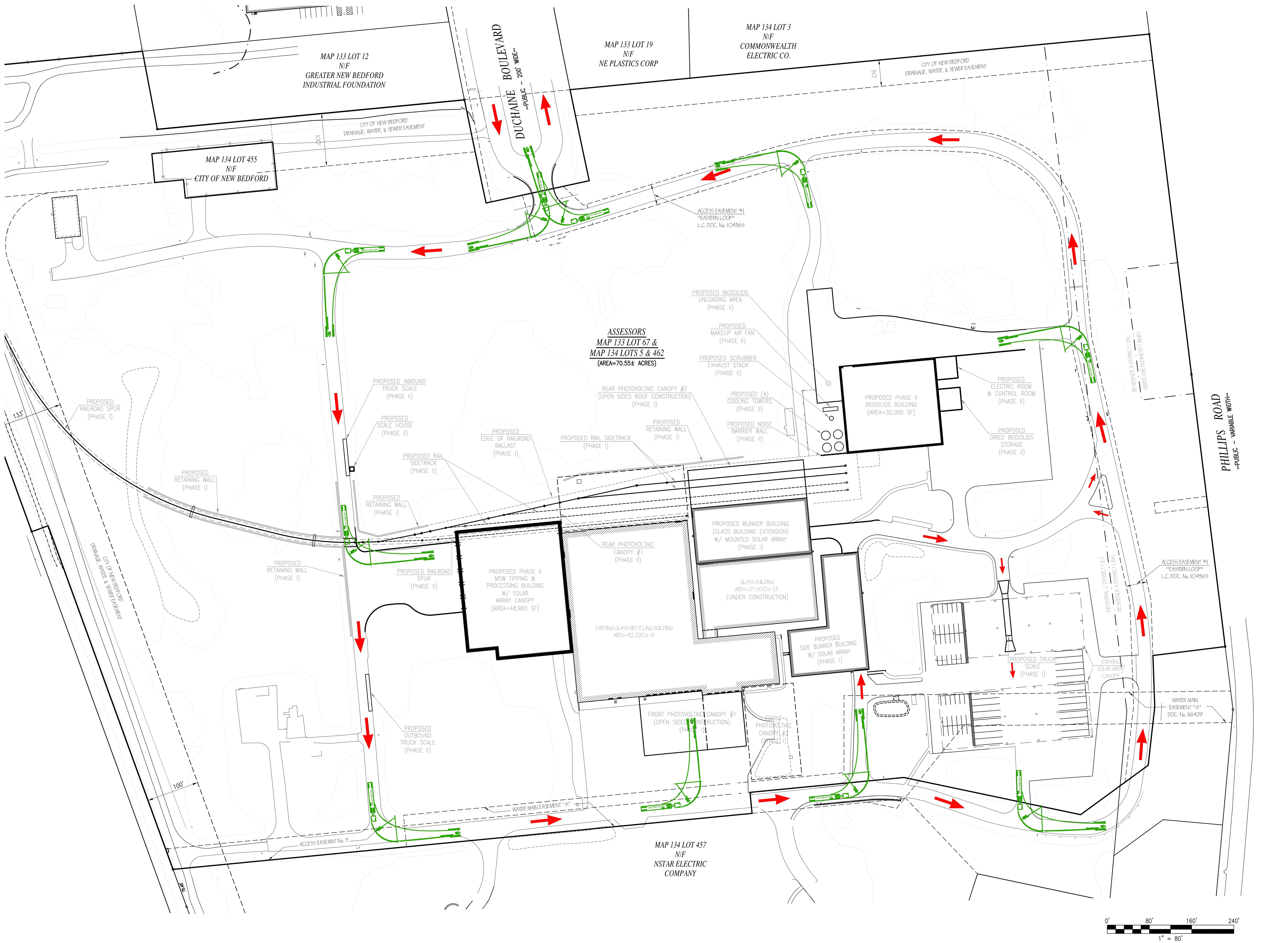
LAYOUT CONT.
SHEET 9 OF 26



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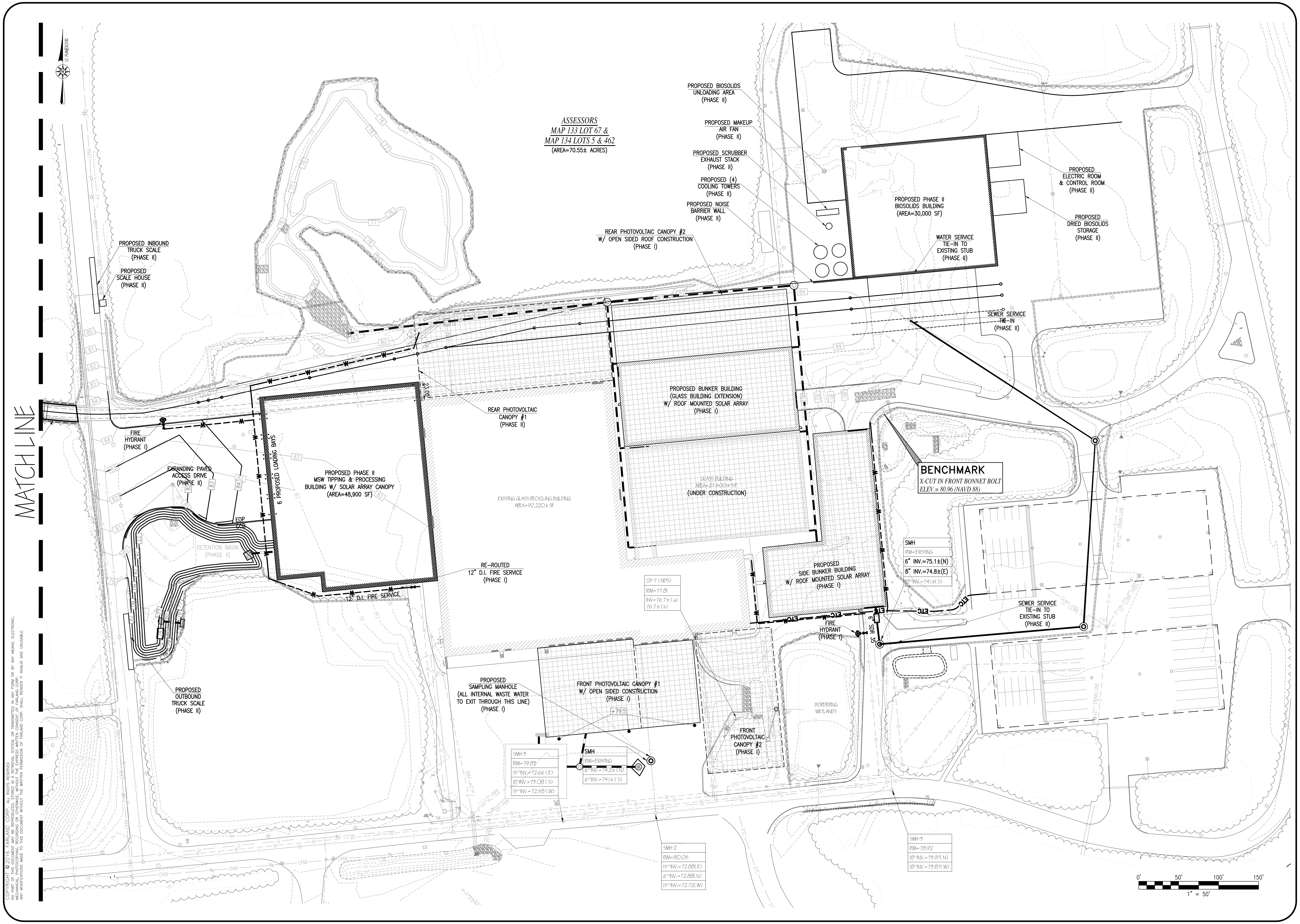
TRAFFIC CIRCULATION

SHEET 10 OF 26



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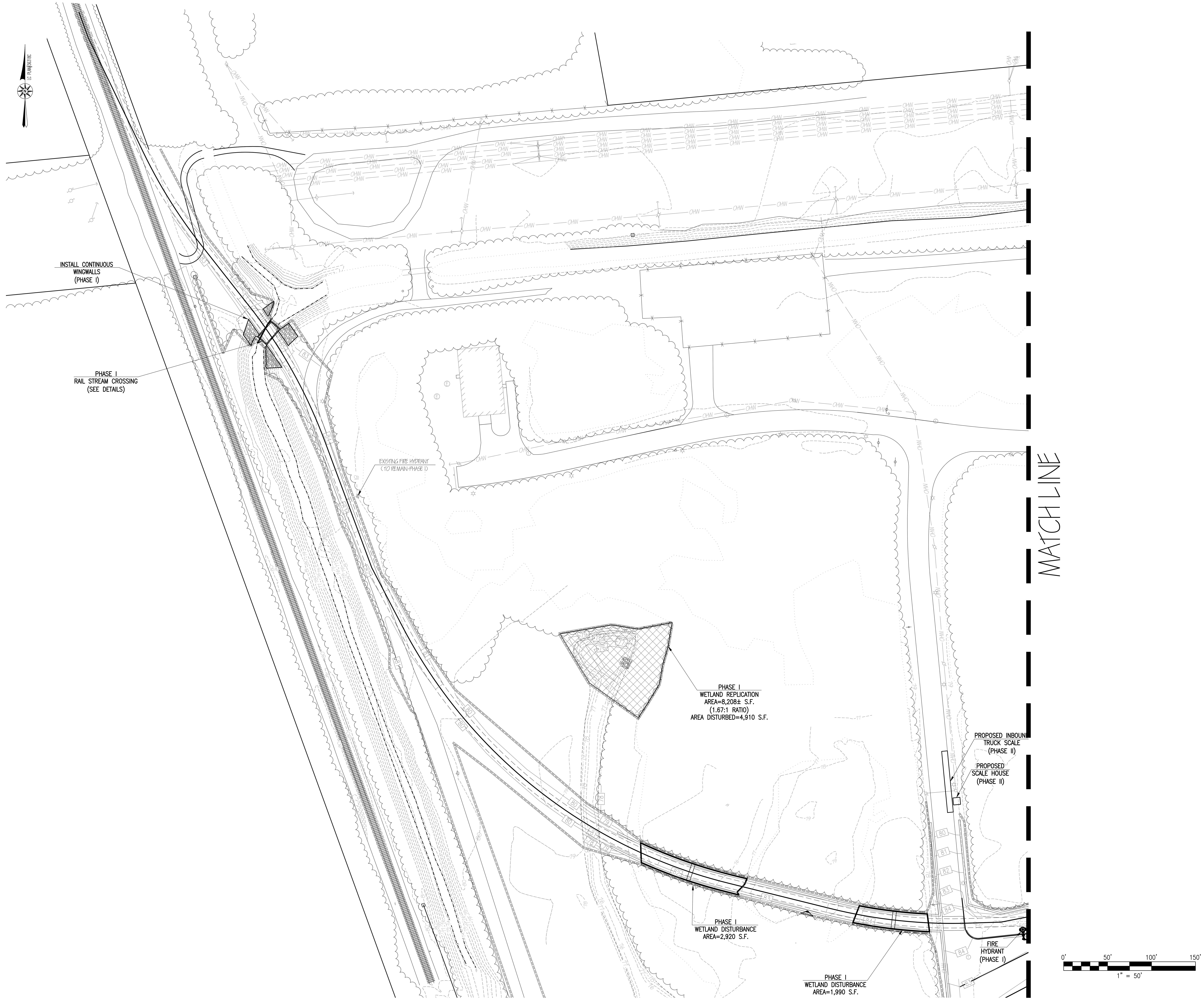
UTILITIES



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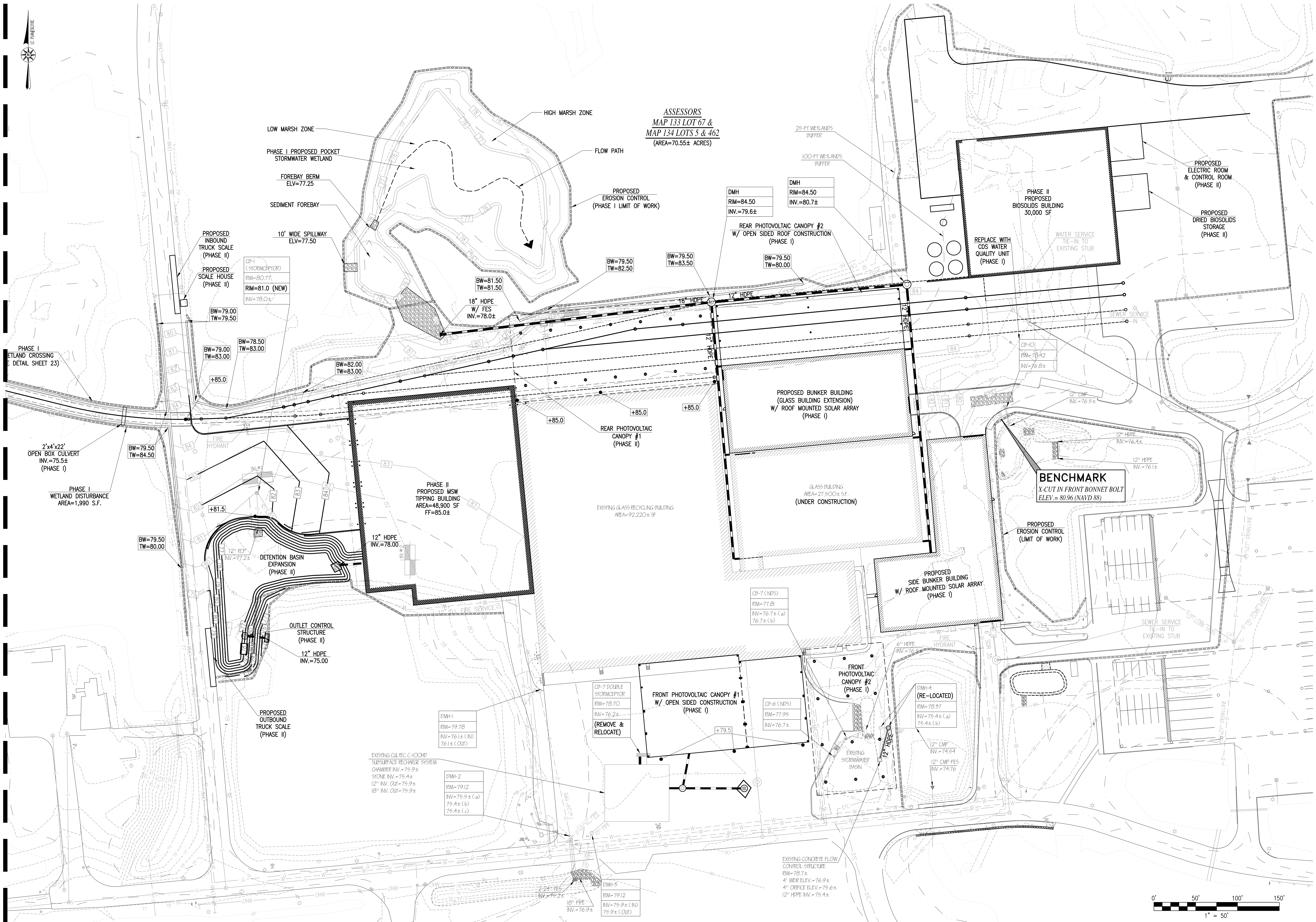


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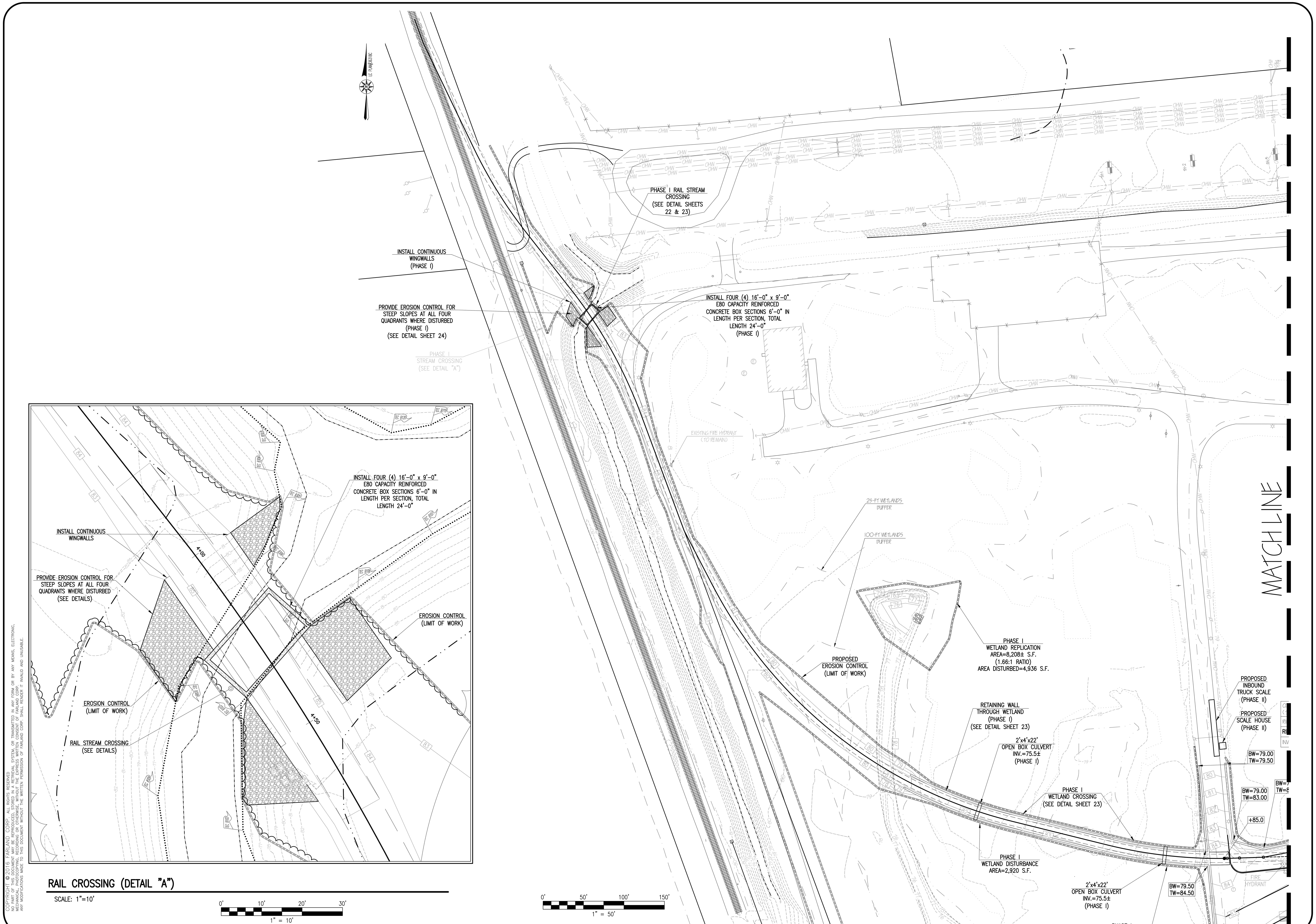
GRADING & DRAINAGE

SHEET 13 OF 26



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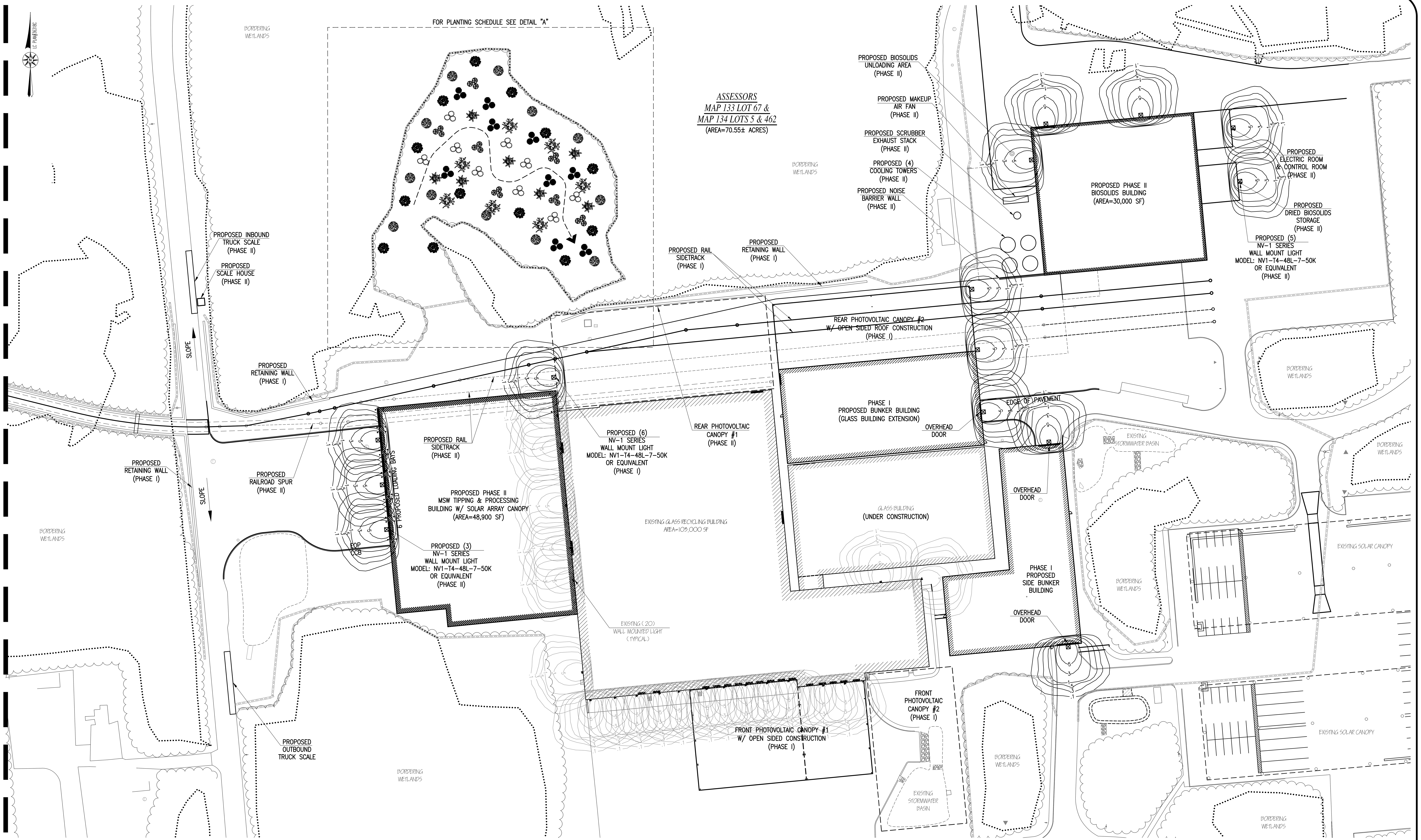
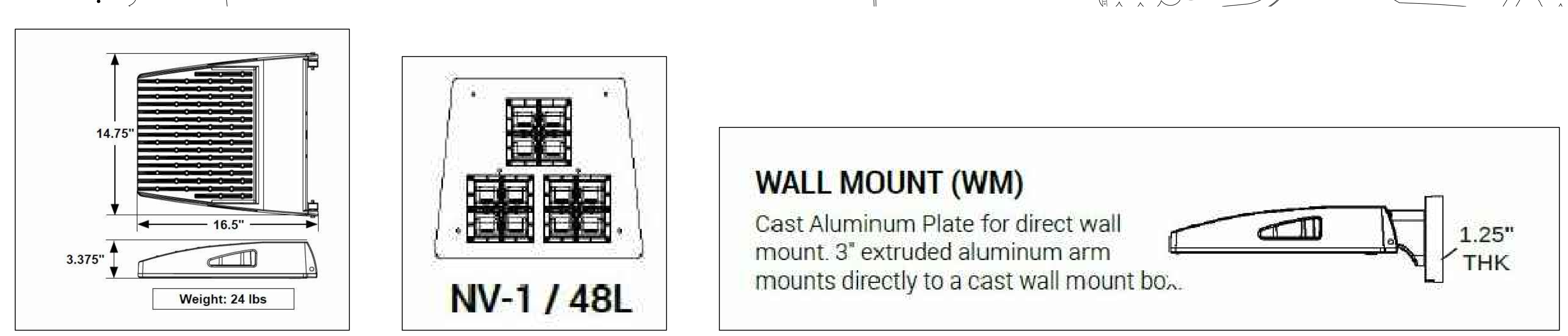
GRADING & DRAINAGE CONT.




WALL MOUNT LIGHT (NV1-T4-48L-7-50K)

NOT TO SCALE

0' 50' 100' 150'
1" = 50'

## REVISIONS

| | | |
|---|---|---|
| 1 | 7/10/19 | CONSERVATION COMMENTS |
| 2 | 8/8/19 | PLANNING BOARD COMMENTS |
| 3 | 9/13/19 | CONSERVATION COMMENTS |
| 4 | 10/15/19 | PHASE I AND II |

COMMONWEALTH OF MASSACHUSETTS
CHRISTIAN ALBERT FARLAND
No. 47544
CIVIL
REGISTERED PROFESSIONAL ENGINEER


FARLAND CORP.
www.FarlandCorp.com
401 COUNTY STREET
NEW BEDFORD, MA 02740
P.508.717.3479
OFFICES IN:
•TAUNTON
•MARLBOROUGH
•WARWICK, RI


DRAWN BY: MJW
DESIGNED BY: CAF
CHECKED BY: CAF

# SITE PLAN
## 100 DUCHAINE BOULEVARD
ASSESSORS MAP 133 LOT 67
ASSESSORS MAP 134 LOTS 5 & 462
NEW BEDFORD, MASSACHUSETTS

PREPARED FOR: PARALLEL PRODUCTS OF NEW ENGLAND
401 INDUSTRY ROAD
LOUISVILLE, KY 40208

JULY 3, 2019
SCALE: 1"=50'
JOB NO. 15-500.2
LATEST REVISION: OCTOBER 15, 2019

LIGHTING & LANDSCAPING




REVISIONS

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# SITE PLAN

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OCTOBER 15, 2019

LIGHTING & LANDSCAPING CONT.

## POCKET WETLAND PLANTING TABLE

| SYMBOL | BOTANICAL NAME | COMMON NAME | SIZE | QUANTITY |
|---|---|---|---|---|
| TREES | | | | |
| | ACER RUBRUM | RED MAPLE | 3 INCH CALIPER | 13 |
| | BETULA POPULIFOLIA | GRAY BIRCH | 3 INCH CALIPER | 12 |
| SHRUBS | | | | |
| | CLETHRA ALNIFOLIA | SWEET PEPPERBUSH | 24 INCH | 27 |
| | VACCINIUM CONYMBOSIUM | HIGHBUSH BLUEBERRY | 24 INCH | 21 |
| | ILEX VERTICILLATA | WINTERBERRY | 24 INCH | 27 |
| GROUND | | | | |
| | ONOCLEA SENSIBILIS | SENSITIVE FERN | 1 GALLON | 28 |
| | OSMUNDA CINNAMOMEA | CINNAMON FERN | 1 GALLON | 28 |

## WETLAND REPLICATION PLANTING TABLE

| SYMBOL | BOTANICAL NAME | COMMON NAME | SIZE | QUANTITY |
|---|---|---|---|---|
| TREES | | | | |
| | ACER RUBRUM | RED MAPLE | 3 INCH CALIPER | 8 |
| | BETULA POPULIFOLIA | GRAY BIRCH | 3 INCH CALIPER | 6 |
| SHRUBS | | | | |
| | CLETHRA ALNIFOLIA | SWEET PEPPERBUSH | 24 INCH | 18 |
| | VACCINIUM CONYMBOSIUM | HIGHBUSH BLUEBERRY | 24 INCH | 18 |
| | ILEX VERTICILLATA | WINTERBERRY | 24 INCH | 12 |
| GROUND | | | | |
| | ONOCLEA SENSIBILIS | SENSITIVE FERN | 1 GALLON | 24 |
| | OSMUNDA CINNAMOMEA | CINNAMON FERN | 1 GALLON | 20 |

## RIVERFRONT RESTORATION PLANTING TABLE

| SYMBOL | BOTANICAL NAME | COMMON NAME | SIZE | QUANTITY |
|---|---|---|---|---|
| TREES | | | | |
| | ACER RUBRUM | RED MAPLE | 3 INCH CALIPER | 3 |
| | BETULA POPULIFOLIA | GRAY BIRCH | 3 INCH CALIPER | 2 |
| SHRUBS | | | | |
| | CLETHRA ALNIFOLIA | SWEET PEPPERBUSH | 24 INCH | 18 |
| | VACCINIUM CONYMBOSIUM | HIGHBUSH BLUEBERRY | 24 INCH | 23 |
| | ILEX VERTICILLATA | WINTERBERRY | 24 INCH | 18 |



### WATERING & MONITORING NOTES:

1. DEPENDING UPON THE WEATHER, THE REPLICATION AREA MAY NEED DAILY WATERING FOR APPROXIMATELY ONE MONTH, OR UNTIL THE PLANTINGS HAVE TAKEN ROOT AND GROWTH IS OBSERVED. IT IS RECOMMENDED THAT PLANTING BE PERFORMED IN APRIL/MAY OR SEPTEMBER/OCTOBER, TO AVOID PLANT MORTALITY DURING SUMMER MONTHS. PLANTINGS SHALL BE WATERED AS NECESSARY TO ENSURE SURVIVAL FOR A MINIMUM TWO-YEAR PERIOD.
2. THE CITY OF NEW BEDFORD CONSERVATION COMMISSION SHALL BE NOTIFIED 72 HOURS IN ADVANCE OF THE COMMENCEMENT OF WETLAND REPLICATION CONSTRUCTION.
3. THE CONSERVATION AGENT OF THE NEW BEDFORD SHALL BE NOTIFIED SO AS TO CONDUCT INSPECTIONS AT THE FOLLOWING MILESTONES OF CONSTRUCTION OF THE REPLICATION AREA: AFTER THE INSTALLATION OF THE EROSION CONTROLS, PRIOR TO THE EXCAVATION OF THE REPLICATION AREAS, AFTER THE SUBGRADE OF THE REPLICATION AREA HAS BEEN EXCAVATED AND AFTER THE FINAL GRADING AND PLANTINGS HAVE BEEN DONE.
4. A WETLAND SCIENTIST OR OTHER QUALIFIED PROFESSIONAL SHALL CONDUCT A PRE-CONSTRUCITON MEETING WITH THE CONTRACTOR, AND SHALL INSPECT THE CONSTRUCTION OF THE REPLICATION AREA UPON EXCAVATION TO THE SUBGRADE, WHEN WETSOIL MIX IS APPLIED AT FINISH GRADE, AND ONCE PLANTING HAVE BEEN INSTALLED.
5. IN COMPLIANCE WITH 310 CMR 10.55(4), THE WETLAND PROFESSIONAL SHALL SUBMIT MONITORING REPORTS DOCUMENTING THE ESTABLISHMENT OF AT LEAST 75% COVERAGE OF INDIGENOUS WETLAND PLANTS WITHIN THE REPLICATION AREA. THESE REPORTS SHALL BE PROVIDED AT THE END OF CONSTRUCTION AND ONE A YEAR FOR TWO YEARS. THE CONSERVATION COMMISSION RESERVES THE RIGHT TO REQUEST ADDITIONAL SEEDING OR PLANTING TO GUARANTEE THE SUCCESS OF THE REPLICATION AREAS. PROPOSED SHRUB AND TREE PLANTINGS THAT DIE DURING THIS TIME PERIOD SHALL BE REPLACED. THE REPORTS SHALL ALSO DOCUMENT THE PRESENCE OF INVASIVE SPECIES WITHIN THE REPLICATION AREA AND RECOMMEND CONTROL METHODS.
6. AFTER THE SECOND GROWING SEASON, A REPORT SHALL BE SUBMITTED TO THE CONSERVATION COMMISSION, STATING THE SUCCESS OF THE WETLAND REPLICATION AREA. IN ACCORDANCE WITH THE PERFORMANCE STANDARDS FOUND IN 310 CMR 10.55(4)(B)(6), IF THE 75% AERIAL COVERAGE CRITERIA IS NOT ACHIEVED, A MITIGATION PLAN SHALL BE SUBMITTED TO THE CONSERVATION COMMISSION AND THE MONITORING PERIOD SHALL BE EXTENDED.

### TEMPORARY DISTURBANCE & RESTORATION NOTES:

1. ALL AREAS THAT ARE ALTERED DURING CONSTRUCTION PERIOD ACTIVITIES THAT WILL NOT CONTAIN PERMANENT STRUCTURES OR SITE FEATURES SHALL BE RESTORED TO A SIMILAR STATE OF THE ORIGINAL CONDITIONS.
2. TOPSOIL SHALL BE STRIPPED AND STOCKPILED FOR REUSE ELSEWHERE ON-SITE. EXCAVATION SHALL EXTEND TO APPROXIMATELY 12" BELOW THE PROPOSED FINAL GRADE ELEVATION. IF DENSE SOILS ARE ENCOUNTERED, IT IS RECOMMENDED TO EXCAVATE AN ADDITIONAL 6" TO ACCOMMODATE WETLAND SOIL MIX.
3. THE WETLAND SOIL AND SEED MIX TO BE USED IN THESE AREAS SHOULD BE "NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES" OR AN APPROVED EQUIVALENT.
4. FOLLOWING THE PLACEMENT OF THE APPROVED SOIL AND SEED MIX, GRADES SHALL BE BLENDED WITH ADJACENT UNDISTURBED AREAS TO PROVIDE AS CLOSE TO ORIGINAL SLOPE AS POSSIBLE.

### CONSTRUCTION SEQUENCE & NOTES

1. THE WETLAND REPLICATION AREA SHALL BE CONSTRUCTED PRIOR TO ANY EARTH DISTURBANCE REQUIRED FOR THE PROPOSED PROJECT.
2. WETLAND REPLICATION SHALL BE PERFORMED UNDER THE DIRECTION AND GUIDANCE OF A QUALIFIED BOTANIST. THE RESUME OF THE WETLAND PROFESSIONAL WHO SHALL OVERSEE THE CONSTRUCTION OF THE WETLAND REPLICATION AREA IS TO BE SUBMITTED TO THE CONSERVAITON COMMISSION OR ITS DESIGNATED AGENT FOR ACCEPTANCE TWO WEEKS PRIOR TO THE INITIATION OF REPLICATION ACTIVITIES.
3. PRIOR TO THE COMMENCEMENT OF WORK, THE LIMITS OF THE EXISTING WETLAND BOUNDARY SHALL BE STAKED OR FLAGGED AT 15' INTERVALS IN THE VICINITY OF THE REPLICATION AREAS, AND AN EROSION CONTROL BARRIER (STRAW WATTLE AND/OR SILT FENCE) SHALL BE INSTALLED ALONG THE PERIMETER OF THE REPLICATION AREA, AS SHOWN ON THE SITE PLAN, TO SERVE AS A LIMIT OF WORK, SUCH THAT NO ACTIVITIES ARE TO OCCUR ON THE WETLAND SIDE OF THE BARRIER.
4. ACCESS TO THE WETLAND REPLICATION AREA SHALL OCCUR FROM UPLAND AREAS AND SHALL NOT RESULT IN IMPACT TO EXISTING WETLANDS..
5. CONSTRUCTION SHALL COMMENCE WITH REMOVAL OF EXISTING VEGETATION WITHIN THE REPLICATION AREA. EXISTING MATURE UPLAND TREES THAT ARE FACULTATIVE OR WETTER MAY BE LEFT ON HUMMOCKS WITHIN THE REPLICATION AREA, AS THEY MAY PROVIDE SHADING TO THE PLANTINGS INSTALLED AROUND THESE HUMMOCKS. EXISTING BOULDERS WITHIN THE REPLICATION AREA ARE ALSO TO REMAIN. BOULDERS SHALL NOT COMPRISE MORE THAN 15% OF THE COVERAGE OF THE REPLICATION AREA.
6. TOPSOIL SHALL BE STRIPPED AND STOCKPILED FOR REUSE ELSEWHERE ON-SITE. EXCAVATION SHALL EXTEND TO APPROXIMATELY 12" BELOW THE PROPOSED FINAL GRADE ELEVATION. IF DENSE SOILS ARE ENCOUNTERED, IT IS RECOMMENDED TO EXCAVATE AN ADDITIONAL 6" TO ACCOMMODATE WETLAND SOIL MIX.
7. THE EXCAVATED REPLICATION AREA FLOOR SHALL BE GRADED TO BLEND WITH UNDISTURBED WETLAND AREAS AND REMAINING HUMMOCKS WHERE EXISTING TREES ARE TO REMAIN. THE REPLICATION AREA SHALL NOT HAVE FINISHED TOPOGRAPHY WHICH RESULTS IN COMPLETELY FLAT TOPOGRAPHY. THE FINISH GRADING SHOULD RESULT IN A SHALLOW PIT AND MOUND TOPOGRAPHY THROUGHOUT THE REPLICATION AREA.
8. A WET SOIL MIX SHALL BE COMPRISED OF THE "O" AND "A" HORIZON SOILS STRIPPED FROM THE WETLAND DISTURBANCE AREA. SHOULD THESE SOILS BE OF INSUFFICIENT QUANTITY OR QUALITY, A CREATED BLEND CONSISTING OF ONE PART SANDY LOAM AND ONE PART COMPOSTED LEAVES OR PEAT MOSS SHALL BE USED.
9. TREE, SHRUB, AND GROUND COVER PLANTINGS SHALL BE INSTALLED PER PLAN IMMEDIATELY FOLLOWING THE EXCAVATION AND PLACEMENT OF ORGANIC SOILS WITHIN THE REPLICATION AREA. DUE TO HIGH PLANT MORTALITY, PLANTING SHOULD BE AVOIDED DURING THE SUMMER MONTHS. LOCATION OF PLANTS MAY BE ADJUSTED IN THE FIELD TO ACCOMMODATE EXISTING TREES AND/OR BOULDERS WHICH ARE TO REMAIN. TREES ARE TO BE PLANTED AT NO MORE THAN 25 FEET ON-CENTER. SHRUBS PLANTED AT 5-6 FEET ON CENTER, AND FERNS AT 3-5 FEET ON CENTER. ALL WETLAND PLANTING IS TO BE PERFORMED BY HAND.
10. AFTER PLANTING IS COMPLETED, THE REPLICATION AREA SHALL BE HAND RAKED TO ELIMINATE ANY DEPRESSIONS GREATER THAN FOUR INCHES IN DEPTH WHICH MAY HAVE BEEN CREATED DURING DIGGING, AND TO ELIMINATE COMPACTION AS MUCH AS POSSIBLE.
11. THE WETLAND FLOOR SHALL BE SEEDED WITH COMMERCIALLY AVAILABLE SEED MIX (NEW ENGLAND WETLAND PLANTS, INC. "NEW ENGLAND WETMIX", OR EQUAL), APPLIED AT A RATE OF 1 LB PER 2.500 S.F.
12. THE FINAL ELEVATIONS OF THE WETLAND REPLICATION AREA SHALL BE SHOWN ON AN AS-BUILT PLAN (0.50' CONTOURS) AND STAMPED BY A MASSACHUSETTS PROFESSIONAL LAND SURVEYOR. A COPY OF THE STAMPED AS-BUILT PLAN SHALL BE PROVIDED TO THE NEW BEDFORD CONSERVATION COMMISSION FOR ACCEPTANCE PRIOR TO THE WETLAND PLANTINGS.
13. THE SEASONAL HIGH GROUNDWATER ELEVATION IN THE WETLAND REPLICATION AREA SHALL BE VERIFIED BY A CERTIFIED SOIL SCIENTIST, WETLAND PROFESSIONAL OR PROFESSIONAL CIVIL ENGINEER PRIOR TO BACKFILLING THE REPLICATION AREA. THE ELEVATION OF THE SEASONAL HIGH GROUNDWATER SHALL BE PROVIDED TO THE CONSERVATION AGENT ALONG WITH VERIFICATION THAT IT WILL SUPPORT THE PROPOSED PLANTINGS.

### SURROUNDING UPLAND PLANT SPECIES

Tree layer
Red maple (Acer rubrum)
White pine (Pinus strobus)
Gray birch (Betula populifolia)
White oak (Quercus alba)
Eastern hemlock (Tsuga canadensis)

Shrub layer
White pine (Pinus strobus)
Gray birch (Betula populifolia)
Black gum (Nyssa sylvatica)
Sweet pepperbush (Clethra alnifolia)
American holly (Ilex opaca)
American beech (Fagus grandifolia)

Climbing woody vines
Round-leaved greenbrier (Smilax rotundifolia)

Herbaceous
Broom sedge (Andropogon virginicus)
Little bluestem (Schizachyrium scoparium)
Unspecified sedge species (Carex sp.)
Trailing raspberry (Rubus sp.)

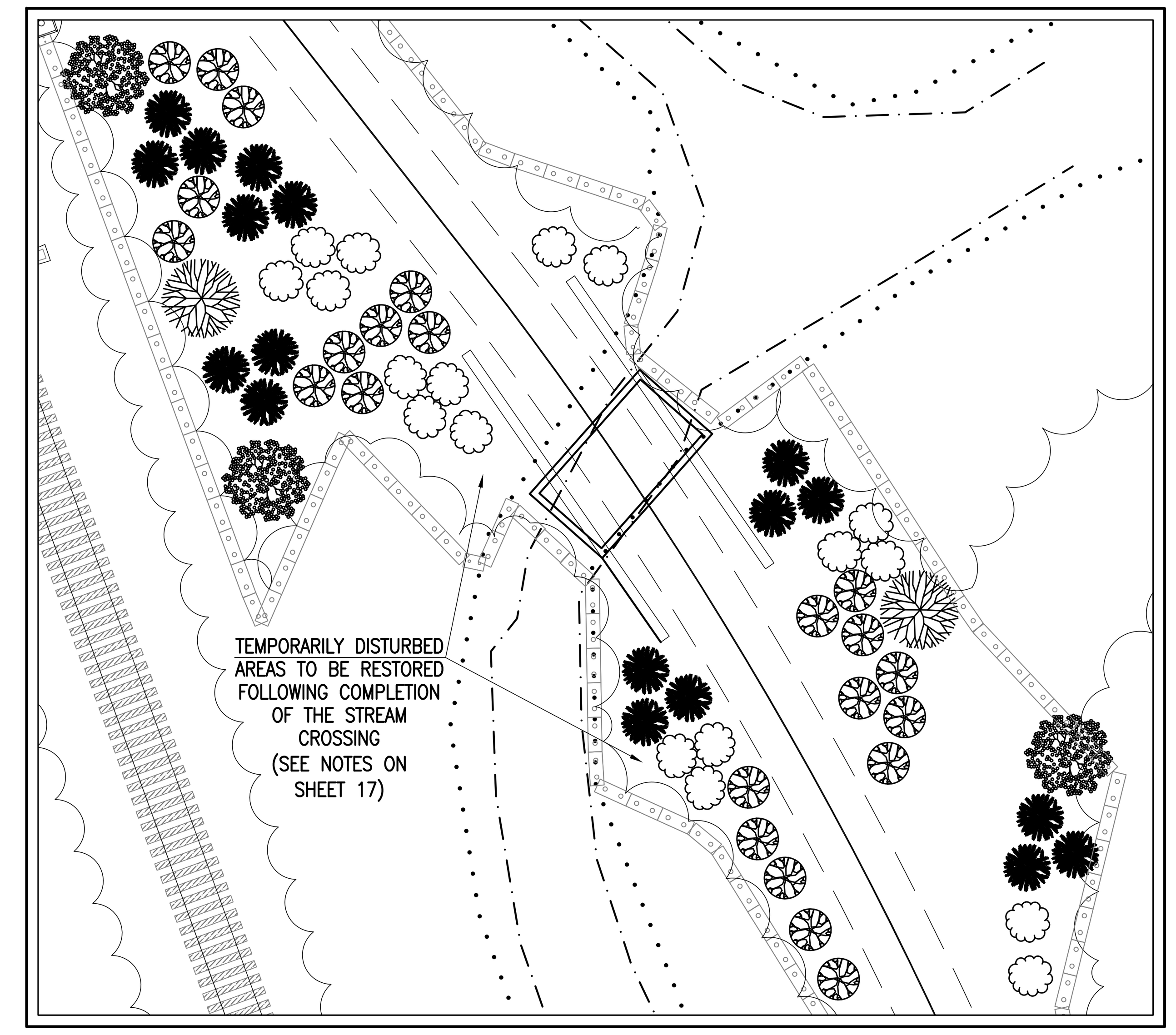
### SURROUNDING WETLAND PLANT SPECIES

Tree layer
Gray birch (Betula populifolia)

Shrub layer
Red maple (Acer rubrum)
Sweet pepperbush (Clethra alnifolia)
Multiflora rose (Rosa multiflora)
Highbush blueberry (Vaccinium corymbosum)
Maleberry (Lyonia ligustrina)
Arrowwood (Viburnum recognitum)

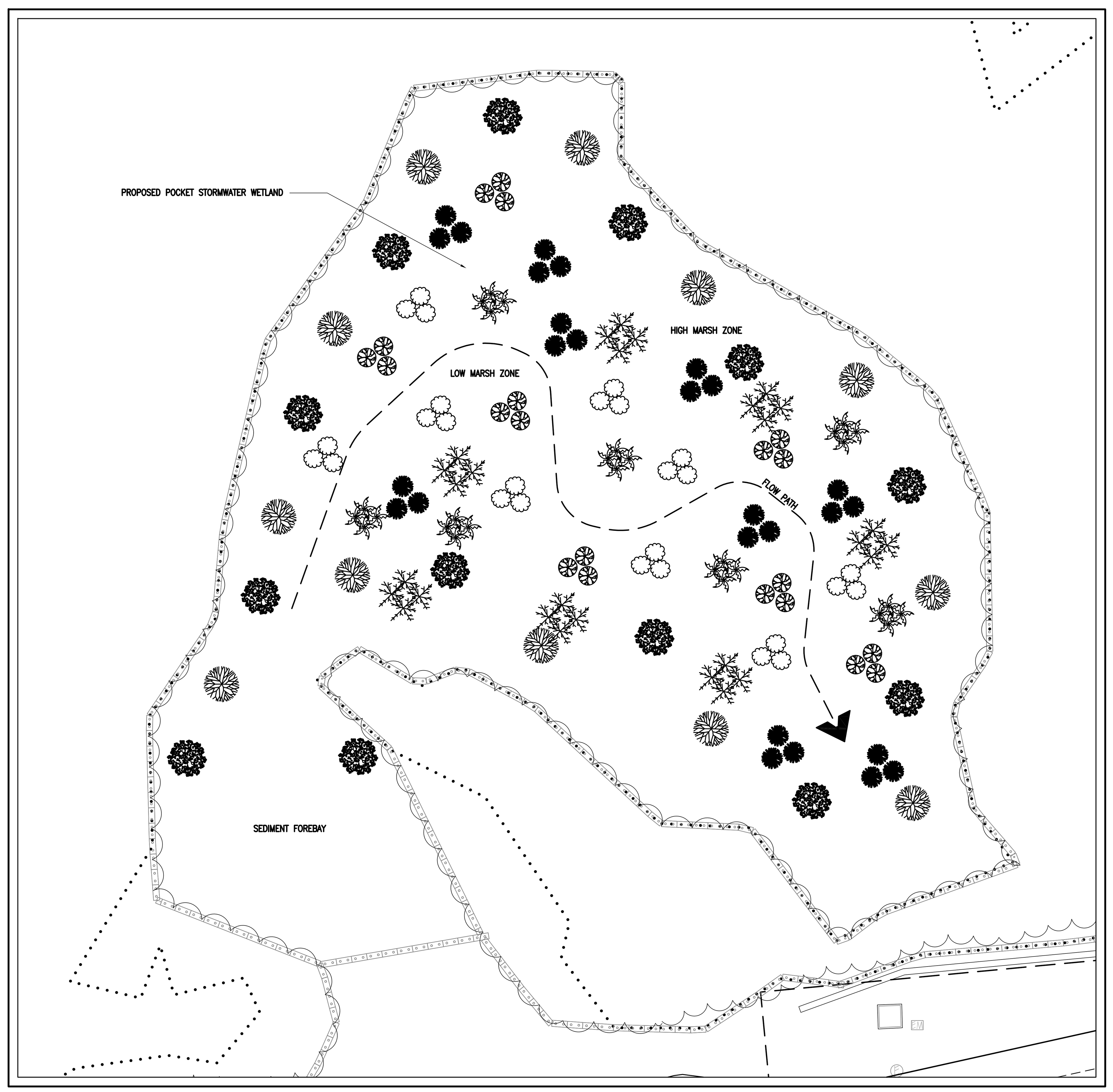
Climbing woody vines
Oriental bittersweet (Celastrus orbiculatus)

Herbaceous layer
Sensitive fern (Onoclea sensibilis)
Cinnamon fern (Osmunda cinnamomea)
Soft rush (Juncus effusus)
Reed canary-grass (Phalaris arundinacea)
Pennsylvania smartweed (Polygonum pensylvanica)
Arrow-leaved tearthumb (Polygonum cuspidatum)



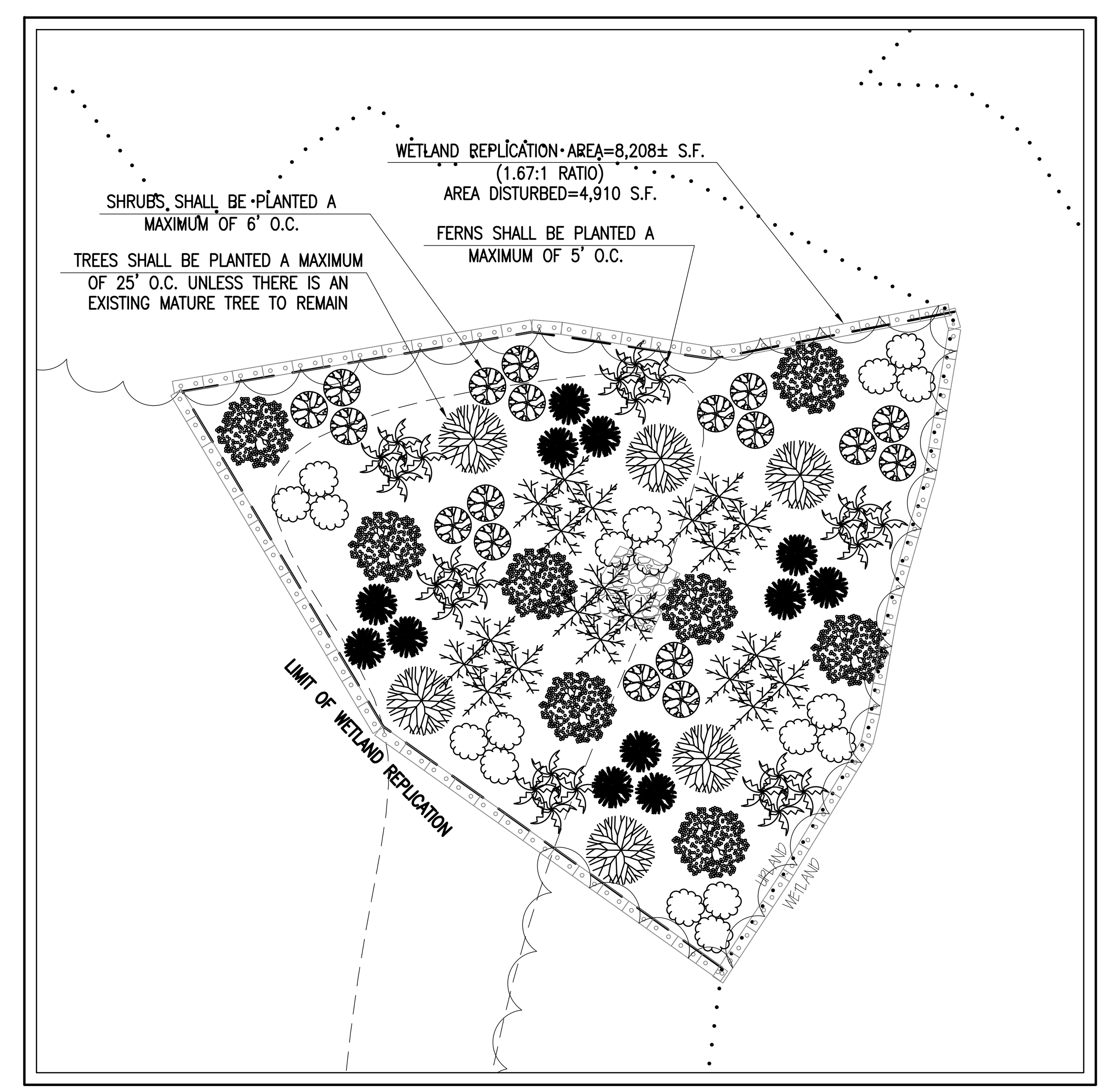

RIVERFRONT AREA RESTORATION (DETAIL "C")

SCALE: 1"=20'




STORMWATER POCKET WETLAND (DETAIL "A")

SCALE: 1"=30'




WETLAND REPLICATION (DETAIL "B")

SCALE: 1"=20'

REVISIONS

| | | |
|---|---|---|
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# SITE PLAN

— 100 DUCHAINE BOULEVARD —
ASSESSORS MAP 133 LOT 67
ASSESSORS MAP 134 LOTS 5 & 462
NEW BEDFORD, MASSACHUSETTS

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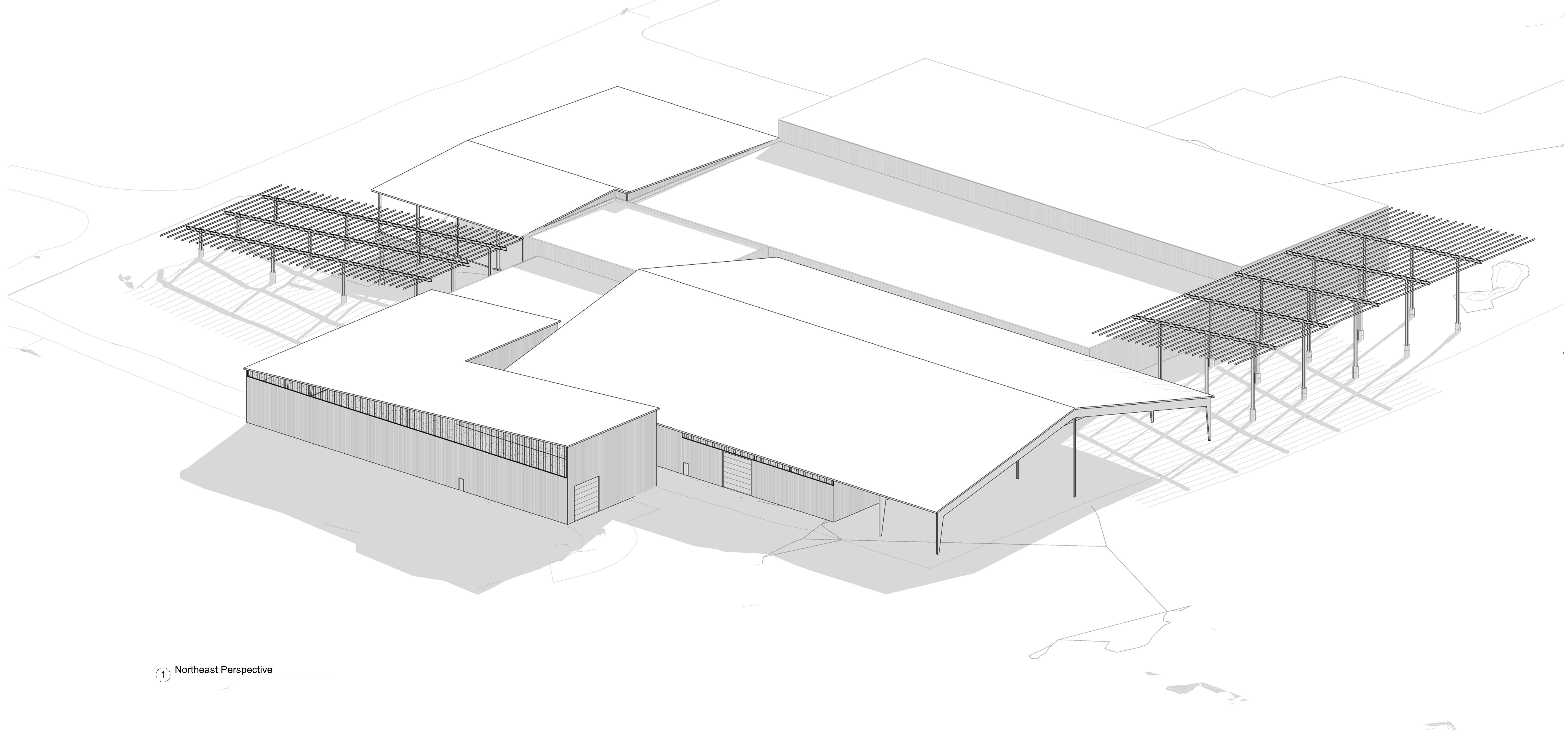
LANDSCAPING & PLANTING SCHEDULES



1 Northeast Perspective

# Parallel Products | Northeast Perspective

Schematic Design Analysis

Project Number: 19-004

Date: 5/20/19

William Starck Architects, Inc. I 126 Cove Street, Fall River MA 02720 I p:508.679.5733 f:508.672.8556 I www.starckarchitects.com

WSA

5/30/2019 1:58:52 PM

## GENERAL CONSTRUCTION NOTES

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AND STRUCTURES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF VARIOUS UTILITY COMPANIES AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THIS INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE LOCATION OF ALL UNDERGROUND UTILITIES AND STRUCTURES SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR MUST CONTACT THE APPROPRIATE UTILITY COMPANY, ANY GOVERNING PERMITTING AUTHORITY, AND "DIG SAFE" AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION WORK TO REQUEST EXACT FIELD LOCATION OF UTILITIES INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION TAKEN BEFORE PROCEEDING WITH THE WORK. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLAN.
2. TOPOGRAPHIC AND PROPERTY LINE SURVEY PERFORMED BY FARLAND CORP. IN APRIL OF 2019.
3. VERTICAL ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 AND HORIZONTAL LOCATIONS REFER TO THE NORTH AMERICAN DATUM (NAD) OF 1983.
4. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL STANDARDS AND REGULATIONS.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING ALL CONTROL POINTS AND BENCH MARKS NECESSARY FOR THE WORK.
6. ALL BENCHMARKS SHOWN ON THIS PLAN ARE TO BE CHECKED FOR CONSISTENCY BY THE CONTRACTOR. ANY DISCREPANCIES MUST BE RESOLVED BY THIS OFFICE PRIOR TO CONSTRUCTION.
7. WHERE PROPOSED PAVEMENT AND WALKS ARE TO MEET EXISTING, THE CONTRACTOR SHALL SAWCUT A NEAT LINE AND MATCH GRADE. SEAL ALL JOINTS WITH HOT BITUMINOUS ASPHALT JOINT SEALER.
8. CURBING TO BE AS INDICATED ON THE PLANS.
9. ALL EXISTING TREES, SHRUBS AND GROUND COVER WHERE NATURAL GRADE IS TO BE RETAINED SHALL BE KEPT IN THEIR EXISTING STATE UNLESS REMOVAL IS REQUIRED FOR CONSTRUCTION PURPOSES.
10. ALL AREAS DISTURBED BY CONSTRUCTION AND NOT TO BE PAVED OR OTHERWISE TREATED AS NOTED ON PLAN SHALL BE TREATED WITH 4" OF LOAM, SEEDED AND HAY MULCHED FOR EROSION CONTROL.
11. SITE IMPROVEMENTS SHALL CONFORM TO A.D.A. SPECIFICATIONS.
12. LIGHTING SHALL BE DIRECTED ON SITE AND AWAY FROM TRAFFIC INTERFERENCE.
13. TEST PITS AND/OR BORINGS WERE TAKEN FOR THE PURPOSE OF DESIGN AND SHOW CONDITIONS AT BORING POINTS ONLY. THEY DO NOT NECESSARILY SHOW THE NATURE OF ALL MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION.
14. THE CONTRACTOR SHALL PROTECT AND/OR CAP OFF ALL EXISTING ON-SITE UTILITY SERVICES ACCORDING TO THE LOCAL AUTHORITY'S SPECIFICATIONS. SERVICES SHALL BE CAPPED OFF WHERE SAME ENTER THE PERIMETER OF THE PROPERTY LINE.
15. CONTRACTOR SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH ALL CONSTRUCTION DOCUMENTS, SPECIFICATIONS AND SITE CONDITIONS PRIOR TO BIDDING AND PRIOR TO CONSTRUCTION.
16. ANY DISCREPANCIES BETWEEN DRAWINGS, SPECIFICATIONS AND SITE CONDITIONS SHALL BE REPORTED IMMEDIATELY TO THE OWNER'S REPRESENTATIVE FOR CLARIFICATION AND RESOLUTION PRIOR TO BIDDING OR CONSTRUCTION.
17. THESE PLANS ARE PERMITTING PLANS AND SHALL NOT TO BE USED FOR CONSTRUCTION. A FINAL SET OF STAMPED PLANS FOR CONSTRUCTION WILL BE ISSUED AFTER RECEIVING FINAL APPROVAL FROM THE LOCAL AND/OR STATE DEPARTMENTS.

## CONSTRUCTION SEQUENCING NOTES

1. CONSTRUCT TEMPORARY AND PERMANENT EROSION CONTROL FACILITIES. EROSION CONTROL FACILITIES SHALL BE INSTALLED PRIOR TO ANY EARTH MOVING.
2. TREE PROTECTION FENCE SHALL BE INSTALLED AND APPROVED BY THE OWNER REPRESENTATIVE PRIOR TO ANY EARTH MOVING.
3. ALL PERMANENT DITCHES AND SWALES ARE TO BE STABILIZED WITH VEGETATION OR RIP RAP PRIOR TO DIRECTING RUNOFF TO THEM.
4. CLEAR CUT, DEMOLISH AND DISPOSE OF EXISTING SITE ELEMENTS NOT TO REMAIN.
5. STORMWATER SHALL NOT BE DIRECTED TOWARDS THE INFILTRATION BASINS UNTIL THE ENTIRE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.
6. GRADE AND GRAVEL ALL PAVED AREAS. ALL PROPOSED PAVED AREAS SHALL BE STABILIZED IMMEDIATELY AFTER GRADING.
7. BEGIN ALL PERMANENT AND TEMPORARY SEEDING AND MULCHING. ALL CUT AND FILL SLOPES SHALL BE SEEDED AND MULCHED IMMEDIATELY AFTER THEIR CONSTRUCTION.
8. DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, SILT FENCES AND MULCH AND SEED AS REQUIRED.
9. FINISH PAVING ALL HARD SURFACE AREAS.
10. INSPECT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES.
11. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
12. REMOVE TEMPORARY EROSION CONTROL MEASURES.
13. THE CONSTRUCTION SEQUENCE SHALL BE CONFINED TO THE LIMIT OF WORK AS SHOWN ON THE DRAWINGS.
14. UPON COMPLETION OF CONSTRUCTION THE OWNER SHALL AGREE TO MAINTAIN AND CLEAN ALL DRAINAGE STRUCTURES AS REQUIRED.

## SITE PREPARATION NOTES

1. WITHIN THE LIMIT OF WORK LINE AS NOTED ON THE SITE PLANS, REMOVE AND DISCARD ALL CONCRETE PAVEMENT, BITUMINOUS CONCRETE PAVEMENT, BRICK PAVEMENT, TOP SOIL, MULCH, TRASH, DEAD TREES AND STUMPS, SHRUBBERY, CHAIN LINK FENCE POSTS, RAILS, FABRIC, GATES, FOOTINGS AND ALL APPURTENANCES, BOLLARDS, POSTS, CONCRETE FOOTINGS AND FOUNDATIONS, WALLS AND CURBS UNLESS OTHERWISE NOTED.
2. THE OWNER'S REPRESENTATIVE SHALL BE CONSULTED AND WILL REVIEW THE WORK ON SITE WITH THE CONTRACTOR BEFORE ANY WORK SHALL COMMENCE.
3. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS IN THE FIELD AND REPORT ANY DISCREPANCIES BETWEEN PLANS AND ACTUAL CONDITIONS TO THE OWNER'S REPRESENTATIVE PRIOR TO STARTING WORK.
4. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING CONDITIONS TO REMAIN THAT ARE DUE TO CONTRACTOR OPERATIONS.
5. ALL ITEMS TO BE REMOVED THAT ARE NOT STOCKPILED FOR LATER REUSE ON THE PROJECT OR DELIVERED TO THE OWNER SHALL BE LEGALLY DISPOSED OF OFF SITE BY THE CONTRACTOR.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS EFFORTS OF THE DEMOLITION WITH ALL TRADES.
7. THE CONTRACTOR SHALL COORDINATE ALL ADJUSTMENT OR ABANDONMENT OF UTILITIES WITH THE RESPECTIVE UTILITY COMPANY.
8. THE CONTRACTOR SHALL MAINTAIN OR ADJUST TO NEW FINISH GRADES AS NECESSARY ALL UTILITY AND SITE STRUCTURES SUCH AS LIGHT POLES, SIGN POLES, MANHOLES, CATCH BASINS, HAND HOLES, WATER AND GAS GATES, HYDRANTS, ETC., FROM MAINTAINED UTILITY AND SITE SYSTEMS UNLESS OTHERWISE NOTED OR DIRECTED BY THE OWNER'S REPRESENTATIVE.

## UTILITY AND GRADING NOTES

1. ALL ON-SITE STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE PIPE (HDPE) OR RCP, UNLESS NOTED OTHERWISE.
2. HDPE PIPE SHALL CONFORM WITH AASHTO DESIGNATIONS M294 AND M252, SHALL BE MANUFACTURED WITH HIGH DENSITY POLYETHYLENE PLASTIC AND SHALL BE ADS N-12 PIPE AS MANUFACTURED BY ADVANCE DRAINAGE SYSTEM, INC. OR HANCOR HI Q PIPE AS MANUFACTURED BY HANCOR, INC. OR APPROVED EQUAL UNLESS OTHERWISE NOTED OR DETAILED.
3. A MINIMUM OF 18" VERTICAL CLEARANCE SHALL BE MAINTAINED WHERE WATER SERVICES CROSS STORM DRAIN LINES.
4. ALL SERVICE CONNECTIONS SHALL BE INSTALLED TO A POINT OF 10 FEET FROM THE BUILDING WALL UNLESS OTHERWISE NOTED OR DETAILED.
5. ALL WATER MAINS SHALL BE INSTALLED WITH A MINIMUM OF 5 FEET OF COVER AND A MAXIMUM OF 6 FEET OF COVER EXCEPT AS NOTED OR DETAILED OTHERWISE. GREATER DEPTHS ARE PERMITTED WHERE REQUIRED TO AVOID CONFLICTS WITH OTHER UTILITIES.
6. GENERALLY, WATER MAIN FITTINGS IDENTIFIED ON THIS DRAWING ARE SHOWN FOR INSTALLATION LOCATION PURPOSE. THE CONTRACTOR SHALL NOTE THAT NOT ALL FITTINGS ARE NOTED, SHOWN OR INDICATED.
7. ALL WATER MAIN FITTINGS, TEES, BENDS, HYDRANTS, ETC. SHALL BE RESTRAINED WITH CONCRETE THRUST BLOCKS.
8. ALL HYDRANTS SHALL BE INSTALLED WITH A 6" C.L.D.I. RUNOUT AND SHALL BE INSTALLED WITH APPROPRIATELY SIZED GATE VALVE, BOX, AND TEE FITTING. ALL HYDRANTS SHALL MEET LOCAL MUNICIPAL SPECIFICATION REQUIREMENTS AND SHALL BE INSTALLED IN ACCORDANCE WITH ALL LOCAL MUNICIPAL REQUIREMENTS.
9. DOMESTIC WATER SERVICES 2.5" AND SMALLER SHALL BE TYPE K COPPER TUBING AND SHALL BE INSTALLED WITH APPROPRIATELY SIZED CORPORATION STOP AND APPROVED SADDLE CURB STOP, AND BOX, USING MATERIALS SPECIFIED BY THE MUNICIPAL WATER DEPARTMENT OR COMPANY.
10. ALL WATER MAINS 3" AND LARGER SHALL BE CEMENT LINED DUCTILE IRON – CLASS 52, AND SHALL BE INSTALLED WITH APPROPRIATELY SIZED FITTINGS AND GATE VALVES.
11. ALL WATER MAIN APPURTENANCES, MATERIALS, METHODS OF INSTALLATION AND TESTING REQUIREMENTS SHALL MEET OR EXCEED ALL LOCAL MUNICIPAL REQUIREMENTS.
12. PRESSURE AND LEAKAGE TEST, DISINFECTION AND FLUSHING SHALL BE IN ACCORDANCE WITH ALL LOCAL MUNICIPAL STANDARDS AND REQUIREMENTS. CONTRACTORS SHALL BE RESPONSIBLE FOR ALL COSTS IN CONNECTION WITH UTILITY TESTS, FLUSHING AND INSPECTIONS AS REQUIRED BY THE LOCAL MUNICIPALITY.
13. PRIMARY WATER METER AND BACKFLOW PREVENTER SHALL BE LOCATED AT THE POINT WHERE THE WATER LINE ENTERS THE BUILDING UNLESS OTHERWISE NOTED OR DETAILED ON THE DRAWINGS.
14. ALL GRAVITY SEWER PIPE SHALL BE PVC PER ASTM D3034, SDR-35 AND ASTM D1784 WITH RUBBER GASKET JOINTS.
15. WHERE SANITARY SEWERS CROSS WATER LINES, THE SEWER SHALL BE LAID AT SUCH AN ELEVATION THAT THE CROWN OF THE SEWER IS AT LEAST EIGHTEEN INCHES BELOW THE INVERT OF THE WATER MAIN. IF THE ELEVATION OF THE SEWER CANNOT BE VARIED TO MEET THIS REQUIREMENT. THE WATER MAIN SHALL BE RELOCATED TO PROVIDE THIS SEPARATION OR CONSTRUCTED WITH MECHANICAL JOINT PIPE FOR A DISTANCE OF TEN FEET ON EACH SIDE OF THE SEWER. ONE FULL LENGTH OF WATER MAIN SHALL BE CENTERED OVER THE SEWER SO THAT BOTH JOINTS WILL BE AS FAR AS THE SEWER AS POSSIBLE. IF MECHANICAL JOINT PIPE IS NOT USED THAN BOTH THE WATER MAIN AND SANITARY SEWER SHALL BE ENCASED IN CONCRETE FOR A MINIMUM DISTANCE OF 10 FEET FROM THE CROSSING POINT OF THE OTHER PIPE AS MEASURED NORMALLY FROM ALL POINTS ALONG THE PIPE.
16. DUE TO THE SMALL SCALE OF THE SITE WORK DRAWINGS, EXACT LOCATION OF UTILITY STUBS FOR BUILDING CONNECTIONS SHALL BE VERIFIED WITH THE BUILDING DRAWINGS. SERVICE STUBS TO THE BUILDING SHALL BE INSTALLED TO A POINT 10 FEET FROM THE BUILDING WALL UNLESS OTHERWISE NOTED OR DETAILED.
17. BEFORE THE DEVELOPMENT SITE IS GRADED, THE AREA OF THE DRAINAGE BASINS SHOULD BE FENCED OFF TO PREVENT HEAVY EQUIPMENT FROM COMPACTING THE UNDERLYING SOIL.
18. WHERE PROPOSED GRADES MEET EXISTING GRADES, CONTRACTOR SHALL BLEND GRADES TO PROVIDE A SMOOTH TRANSITION BETWEEN EXISTING AND NEW WORK. PONDING AT TRANSITION AREAS WILL NOT BE ALLOWED.
19. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE AWAY FROM ALL BUILDING FOUNDATIONS AND STRUCTURES.
20. MAXIMUM SLOPE IN DISTURBED AREAS SHALL NOT EXCEED 3:1 , UNLESS OTHERWISE NOTED.
21. CONTRACTOR SHALL VERIFY EXISTING GRADES AND NOTIFY OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES.
22. CONTRACTOR SHALL ADJUST UTILITY ELEMENT MEANT TO BE FLUSH WITH GRADE THAT IS AFFECTED BY SITE WORK OR GRADE CHANGES, WHETHER SPECIFICALLY NOTED ON PLANS OR NOT.
23. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE OWNER'S REPRESENTATIVE FOR RESOLUTION OF THE CONFLICT.
24. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF ALL GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.
25. ELECTRICAL DUCT BANK LOCATION IS SHOWN FOR COORDINATION PURPOSES, REFER TO ELECTRICAL PLANS FOR SECTIONS AND DETAILS OF THE UTILITY DUCT BANK.
26. THE LOCATION, SIZE, DEPTH AND SPECIFICATIONS FOR CONSTRUCTION OF PRIVATE UTILITY SERVICES SHALL BE INSTALLED ACCORDING TO THE REQUIREMENTS PROVIDED BY AND APPROVED BY THE RESPECTIVE UTILITY COMPANY (GAS, TELEPHONE AND ELECTRICAL). FINAL DESIGN AND LOCATIONS AT THE BUILDING WILL BE PROVIDED BY THE ARCHITECT. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF THE UTILITY CONNECTIONS WITH THE RESPECTIVE COMPANIES PRIOR TO ANY UTILITY CONSTRUCTION.

## LAYOUT AND MATERIAL NOTES

1. CONTRACTOR SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH ALL CONSTRUCTION DOCUMENTS, SPECIFICATIONS AND SITE CONDITIONS PRIOR TO BIDDING AND PRIOR TO CONSTRUCTION.
2. ANY DISCREPANCIES BETWEEN DRAWINGS, SPECIFICATIONS AND SITE CONDITIONS SHALL BE REPORTED IMMEDIATELY TO THE OWNER'S REPRESENTATTIVE FOR CLARIFICATION AND RESOLUTION PRIOR TO BIDDING OR CONSTRUCTION.
3. SEE ARCHITECTURAL DRAWINGS FOR EXACT BUILDING DIMENSIONS AND ALL DETAILS CONTIGUOUS TO THE BUILDING INCLUDING SIDEWALKS, RAMPS, UTILITY ENTRANCE LOCATIONS, WALL PACKS, CONCRETE DOOR PADS, ROOF DRAINS, ETC.
4. ACCESSIBLE CURB RAMPS SHALL BE PER THE MASSACHUSETTS ARCHITECTURAL ACCESS BOARD AND THE AMERICANS WITH DISABILITIES ACT ACCESSIBLITY GUIDELINES, WHICHER IS MORE STRINGENT.
5. THE FOLLOWING LAYOUT CRITERIA SHALL CONTROL UNLESS OTHERWISE NOTED ON THE PLAN:
   ALL DIMENSIONS ARE TO OUTSIDE FACE OF BUILDING.
   ALL DIMENSIONS ARE TO FACE OF CURB AT GUTTER LINE.
   ALL DIMENSIONS ARE TO CENTER OF PAVEMENT MARKINGS.
   ALL TIES TO PROPERTY LINES ARE PERPENDICULAR TO THE PROPERTY LINE UNLESS OTHERWISE NOTED.

## SOIL EROSION AND SEDIMENT CONTROL NOTES

1. THE CONSERVATION COMMISSION SHALL BE NOTIFIED, AT LEAST 72 HOURS PRIOR TO ANY LAND DISTURBANCE.
2. A COPY OF THE SOIL EROSION AND SEDIMENT CONTROL PLAN MUST BE MAINTAINED ON THE PROJECT SITE DURING CONSTRUCTION.
3. SOIL EROSION AND SEDIMENT CONTROL PRACTICES IN THE PLAN SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
4. ALL APPLICABLE SOIL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE IN PLACE PRIOR TO ANY DEMOLITION GRADING OPERATIONS AND/OR INSTALLATION OF PROPOSED STRUCTURES OR UTILITIES.
5. ALL APPLICABLE SOIL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE LEFT IN PLACE UNTIL CONSTRUCTION IS COMPLETED AND/OR THE AREA IS STABILIZED.
6. ALL SOIL EROSION AND SEDIMENT CONTROL STRUCTURES SHALL BE INSPECTED AND MAINTAINED ON A REGULAR BASIS AND AFTER EVERY STORM EVENT.
7. THE MAINTENANCE OF SOIL EROSION AND SEDIMENT CONTROL MEASURES AND FACILITIES DURING AND IMMEDIATELY AFTER CONSTRUCTION RESTS WITH THE GENERAL CONTRACTOR. UPON ACCEPTANCE OF THE PROJECT, THE OWNER SHALL BECOME RESPONSIBLE FOR MAINTENANCE OF ANY REMAINING MEASURES AND FACILITIES.
8. OFF SITE SEDIMENT DISTURBANCE MAY REQUIRE ADDITIONAL CONTROL MEASURES TO BE DETERMINED BY THE ENGINEER.
9. THE CONSERVATION COMMISSION AND/OR ENGINEER MAY REQUIRE ADDITIONAL SOIL EROSION MEASURES TO BE INSTALLED, AS DIRECTED BY THE DISTRICT INSPECTOR.
10. ADJOINING PROPERTIES SHALL BE PROTECTED FROM EXCAVATION AND FILLING OPERATIONS AT ALL TIMES.
11. THE CONTRACTOR SHALL UTILIZE ALL METHODS NECESSARY TO PREVENT BLOWING AND MOVEMENT OF DUST FROM THE EXPOSED SOIL SURFACES.
12. PAVED ROADWAYS MUST BE KEPT CLEAN AT ALL TIMES.
13. A CRUSHED STONE TIRE CLEANING PAD WILL BE INSTALLED WHEREVER A CONSTRUCTION ENTRANCE EXISTS. SEE LOCATION DETAIL ON PLAN.
14. ALL CATCH BASIN INLETS SHALL BE PROTECTED DURING CONSTRUCTION AS DETAILED ON THE PLAN, IF APPLICABLE.
15. ALL STORM DRAINAGE OUTLETS SHALL BE PROTECTED AS REQUIRED HEREON BEFORE DISCHARGE POINTS BECOME OPERATIONAL.
16. THE SITE SHALL AT ALL TIMES BE GRADED AND MAINTAINED SUCH THAT ALL STORMWATER RUNOFF IS DIVERTED TO SOIL EROSION AND SEDIMENT CONTROL FACILITIES.
17. LAND AREAS EXPOSED AT ANY ONE TIME AND THE LENGTH OF EXPOSURE SHALL BE KEPT TO A PRACTICAL MINIMUM. THEY SHALL BE LEFT IN A NEAT AND FINISHED APPEARANCE AND PROTECTED FROM EROSION.
18. ANY DISTURBED AREA THAT WILL BE LEFT EXPOSED FOR MORE THAN SIXTY (60) DAYS AND NOT SUBJECT TO CONSTRUCTION TRAFFIC SHALL IMMEDIATELY RECEIVE A TEMPORARY SEEDING AND FERTILIZATION. IF THE SEASON PROHIBITS TEMPORARY SEEDING, THE DISTRIBUTED AREAS SHALL BE MULCHED.
19. ALL CRITICAL AREAS SUBJECT TO EROSION SHALL RECEIVE A TEMPORARY SEEDING AND BE MULCHED IN ACCORDANCE WITH THE SPECIFICATIONS IMMEDIATELY FOLLOWING ROUGH GRADING.
20. IMMEDIATELY AFTER COMPLETION OF STRIPPING AND STOCKPILING OF TOPSOIL, SEED THE STOCKPILE WITH ANNUAL RYE GRASS. STABILIZE TOPSOIL STOCKPILES WITH STRAW MULCH FOR PROTECTION IF THE SEASON DOES NOT PERMIT THE APPLICATION AND ESTABLISHMENT OF TEMPORARY SEEDING.
21. SOIL STOCKPILES ARE NOT TO BE LOCATED WITHIN FIFTY (50) FEET OF WETLANDS, THE FLOODPLAIN, SLOPE, ROADWAY OR DRAINAGE FACILITIES. THE BASE OF ALL STOCKPILES SHALL BE PROTECTED BY A HAY BALE BARRIER OR SEDIMENT FENCE. LOCATIONS ARE DELINEATED ON THE PLAN.
22. MAXIMUM SIDE SLOPES OF ALL EXPOSED SURFACES SHALL NOT BE CONSTRUCTED STEEPER THAN 3:1 UNLESS OTHERWISE APPROVED BY THE DISTRICT.
23. ALL AREAS NOT STABILIZED BY CONSTRUCTION, SODDING OR LANDSCAPING SHALL BE SEEDED AND STABILIZED IN ACCORDANCE WITH THE SEEDING AND MULCHING SPECIFICATIONS.
24. MULCHING IS REQUIRED ON ALL SEEDED AREAS TO INSURE AGAINST EROSION BEFORE GRASS IS ESTABLISHED TO PROMOTE EARLIER VEGETATIVE COVER.
25. ALL DEWATERING OPERATIONS MUST DISCHARGE DIRECTLY INTO A SEDIMENT FILTRATION DEVICE. THE SEDIMENT FILTER MUST BE CAPABLE OF FILTERING THE SEDIMENT AND BE PLACED SO AS NOT TO CAUSE EROSION OF THE DOWNSTREAM AREA.

## GENERAL PLANTING NOTES

1. ALL PLANT MATERIAL SHALL CONFORM TO THE STANDARDS OF THE AMERICAN ASSOCIATION OF NURSERYMEN OR THE PLANT MATERIAL WILL BE UNACCEPTABLE. ALL PLANT MATERIAL SHALL BE TRUE TO SPECIES, VARIETY, SIZE AND BE CERTIFIED DISEASE AND INSECT FREE. THE OWNER AND/OR THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO APPROVE ALL PLANT MATERIAL ON SITE PRIOR TO INSTALLATION.
2. ALL PLANT MATERIAL SHALL BE PROPERLY GUYED, STAKED, WRAPPED, AND PLANTED IN CONFORMANCE WITH THE TYPICAL PLANTING DETAILS. GUY WIRES SHALL BE ATTACHED TO THE TREE AT A HEIGHT OF TWO-THIRDS THE HEIGHT OF THE TREE AND SHOULD BE LOCATED AT POINTS SO AS NOT TO SPLIT THE TRUNK OF MULTI-STEMMED TREES. PROVIDE THREE STAKES PER TREE UNLESS NOTED OTHERWISE INSTALL ALL PLANT MATERIAL ON UNDISTURBED GRADE. PROVIDE BURLAP WRAPPING WITH A 50% OVERLAP. CUT AND REMOVE BURLAP FROM TOP ONE-THIRD OF THE ROOT BALL.
3. PROVIDE PLANTING PITS AS INDICATED ON PLANTING DETAILS. BACKFILL PLANTING PITS WITH ONE PART EACH OF TOP SOIL, PEAT MOSS, AND PARENT MATERIAL. IF WET SOIL CONDITIONS EXIST THEN PLANTING PITS SHALL BE EXCAVATED AN ADDITIONAL 12" AND FILLED WITH SAND.
4. NEWLY INSTALLED PLANT MATERIAL SHALL BE WATERED AT THE TIME OF INSTALLATION AND SHALL BE SUBSEQUENTLY FLOODED TWICE WITHIN TWENTY-FOUR (24) HOURS OF PLANTING. REGULAR WATERING SHALL BE PROVIDED TO ENSURE THE ESTABLISHMENT, GROWTH AND SURVIVAL OF ALL PLANTS.
5. ALL PLANT MATERIAL SHALL BE GUARANTEED FOR ONE YEAR AFTER THE DATE OF FINAL ACCEPTANCE. ANY PLANT MATERIAL THAT DIES WITHIN THAT TIME PERIOD SHALL BE REMOVED, INCLUDING THE STUMP, AND REPLACED WITH MATERIAL OF SIMILAR SIZE AND SPECIES AT THE EXPENSE OF THE DEVELOPER. THE REPLACED PLANT MATERIAL SHALL BE GUARANTEED FOR ONE YEAR AFTER THE REPLACEMENT DATE.
6. THE LANDSCAPE CONTRACTOR SHALL PROVIDE A MINIMUM 4" LAYER OF TOPSOIL IN ALL LAWN AREAS AND A MINIMUM OF 6" OF TOPSOIL IN ALL PLANTING AREAS. A FULL SOIL ANALYSIS SHALL BE CONDUCTED AFTER CONSTRUCTION AND PRIOR TO PLANTING TO DETERMINE THE EXTENT OF SOIL AMENDMENT REQUIRED.
7. ALL DISTURBED LAWN AREAS SHALL BE STABILIZED WITH EITHER SOD OR SEED AS INDICATED ON THE LANDSCAPE PLANS. SEED SHALL CONSIST OF THE MIXTURE LISTED IN THE GENERAL SEEDING NOTES. ALL DISTURBED LAWN AREAS SHALL BE TOP SOILED, LIMED, FERTILIZED, AND FINE GRADED PRIOR TO LAWN INSTALLATION.
8. ALL PLANTING BEDS SHALL RECEIVE 3" OF SHREDDED PINE, CEDAR OR HEMLOCK BARK.
9. ALL SHRUB MASSES SHALL BE PLANTED IN CONTINUOUS MULCHED BEDS.
10. ALL TREES ARE TO BE GUYED, 3 EACH, UNLESS OTHERWISE NOTED ON PLAN.
11. ALL DECIDUOUS TREES ARE TO BE WRAPPED, WITH TREE WRAP, UP TO THE FIRST BRANCHING AND SECURED.
12. THE LANDSCAPE CONTRACTOR IS TO PERFORM ALL CONTRACTED WORK IN A REASONABLE PERIOD OF CONTINUOUS WORK.
13. THE LANDSCAPE CONTRACTOR IS TO MAINTAIN PLANT MATERIAL WHILE THE PROJECT IS UNDERWAY AND FOR A PERIOD OF TWO WEEKS AFTER THE COMPLETION OF THE PROJECT UNLESS OTHERWISE SPECIFIED.
14. THE CONTRACTOR IS TO CLEAN UP AND REMOVE ANY DEBRIS FROM THE SITE, CAUSED BY THE LANDSCAPE CONTRACTOR.

## LEGEND

| EXISTING | | PROPOSED |
|---|---|---|
| 101 | CONTOUR LINE | 101 |
| x101.1 | SPOT GRADE | +101.1 |
| EOP | EDGE OF PAVEMENT | EOP |
| VGC | VERTICAL GRANITE CURB | VGC |
| SGC | SLOPED GRANITE CURB | SGC |
| VCC | VERTICAL CONCRETE CURB | VCC |
| BCC | BITUMINOUS CONCRETE CURB | BCC |
| CCB | CAPE COD BERM | CCB |
| | STONE WALL | |
| | CHAIN LINK FENCE | |
| | IRON FENCE | |
| | POST & RAIL FENCE | |
| | STOCKADE FENCE | |
| | GUARD RAIL | |
| | HAY BALES | |
| W W | WATER LINE | W W |
| | FIRE HYDRANT | |
| | POST INDICATOR VALVE | |
| | WATER GATE | |
| WM | WATER METER PIT | |
| | IRRIGATION HAND HOLE | |
| W | WELL | |
| S S | SEWER LINE | |
| S | SEWER MANHOLE | |
| G G | GAS LINE | |
| GM | GAS METER | |
| | GAS GATE | |
| D D | DRAIN LINE | |
| | DRAIN MANHOLE | |
| | CATCH BASIN | |
| OHW OHW | OVERHEAD WIRES | |
| ETC ETC | ELECTRIC, TELEPHONE & CABLE | |
| | UTILITY POLE | |
| | GUY WIRE | |

REVISIONS

| | | |
|---|---|---|
| 1 | 7/10/19 | CONSERVATION COMMENTS |
| 2 | 8/8/19 | PLANNING BOARD COMMENTS |
| 3 | 9/13/19 | CONSERVATION COMMENTS |
| 4 | 10/15/19 | PHASE I AND II |

COMMONWEALTH OF MASSACHUSETTS
CHRISTIAN ALBERT FARLAND
No. 47544
CIVIL
REGISTERED PROFESSIONAL ENGINEER

FARLAND CORP.
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401 COUNTY STREET
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P.508.717.3479
OFFICES IN:
●TAUNTON
●MARLBOROUGH
●WARWICK, RI

DRAWN BY: MJW
DESIGNED BY: CAF
CHECKED BY: CAF

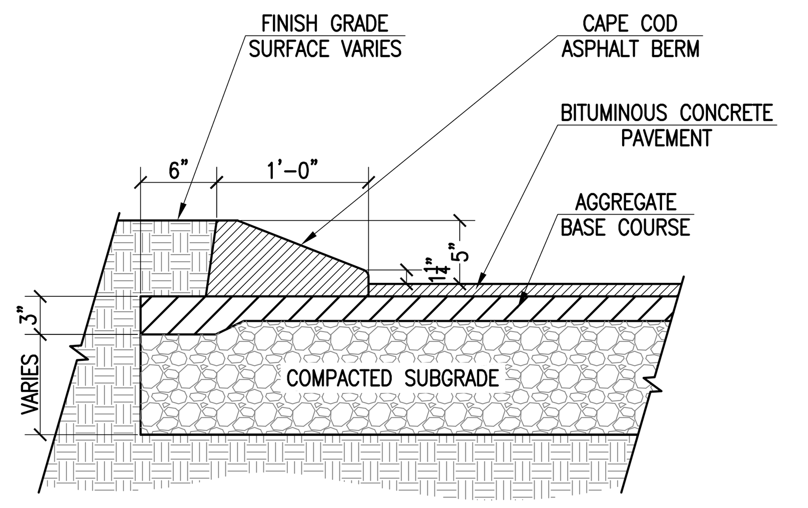
SITE PLAN
— 100 DUCHAINE BOULEVARD —
ASSESSORS MAP 133 LOT 67
ASSESSORS MAP 134 LOTS 5 & 462
NEW BEDFORD, MASSACHUSETTS

PREPARED FOR: PARALLEL PRODUCTS OF NEW ENGLAND
401 INDUSTRY ROAD
LOUISVILLE, KY 40208

JULY 3, 2019
SCALE: AS NOTED
JOB NO. 15-500.2
LATEST REVISION:
OCTOBER 15, 2019

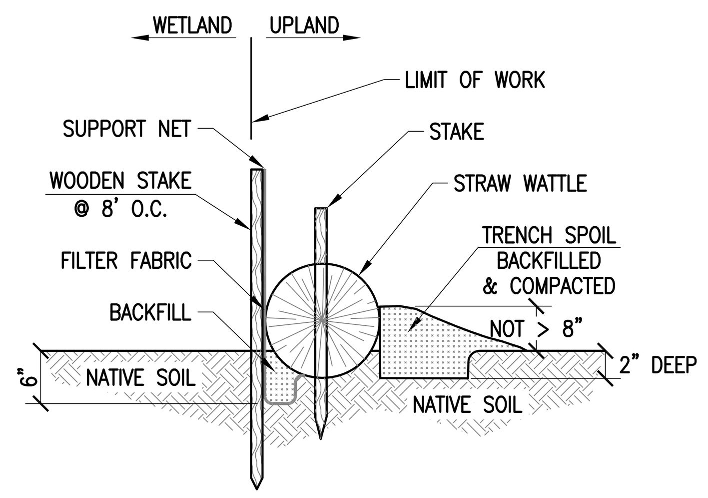
NOTES & LEGEND

SHEET 19 OF 26



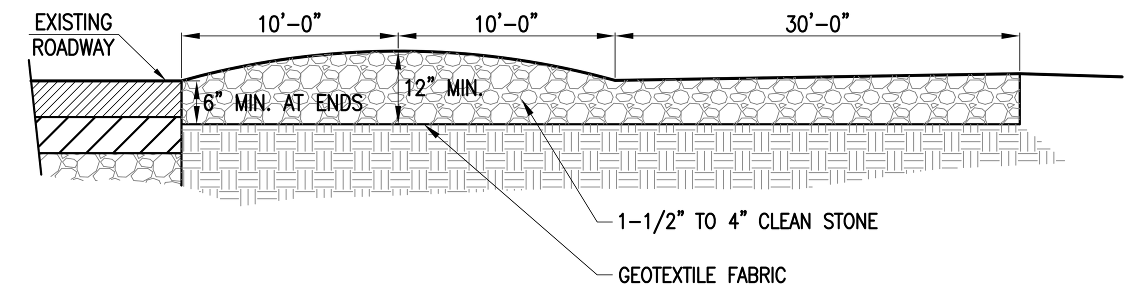

## BITUMINOUS CONCRETE CAPE COD BERM

NOT TO SCALE




## STAKED STRAW WATTLE WITH SILT FENCE

NOT TO SCALE



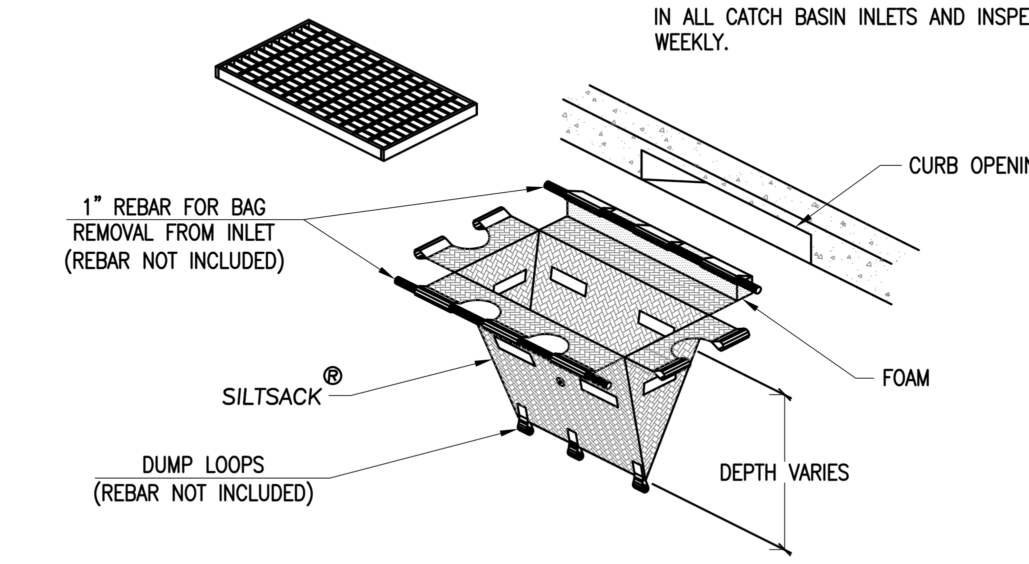

(12' WIDE MINIMUM)

NOTE: PURPOSE IS TO REMOVE MUD FROM TIRES OF CONSTRUCTION VEHICLES.

## TEMPORARY CONSTRUCTION ENTRANCE

NOT TO SCALE

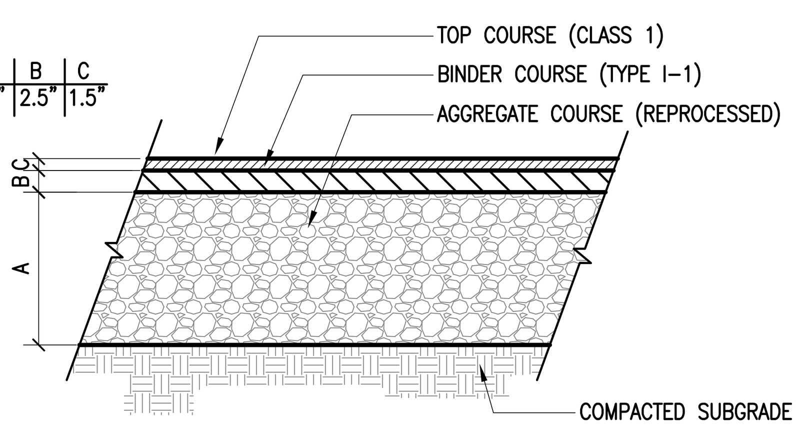
NOTE:
REGULAR FLOW SILTSACKS SHALL BE INSTALLED IN ALL CATCH BASIN INLETS AND INSPECTED WEEKLY.




## REGULAR FLOW SILTSACK®

NOT TO SCALE

| | A | B | C |
|---|---|---|---|
| DEPTH | 8" | 2.5" | 1.5" |

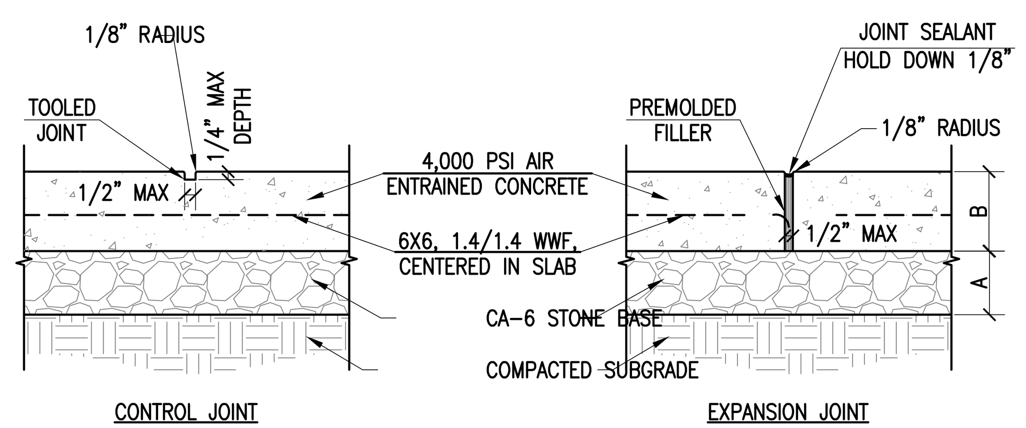



## BITUMINOUS CONCRETE PAVEMENT

NOT TO SCALE

| | A | B |
|---|---|---|
| CONCRETE WALK | 4" | 4" |

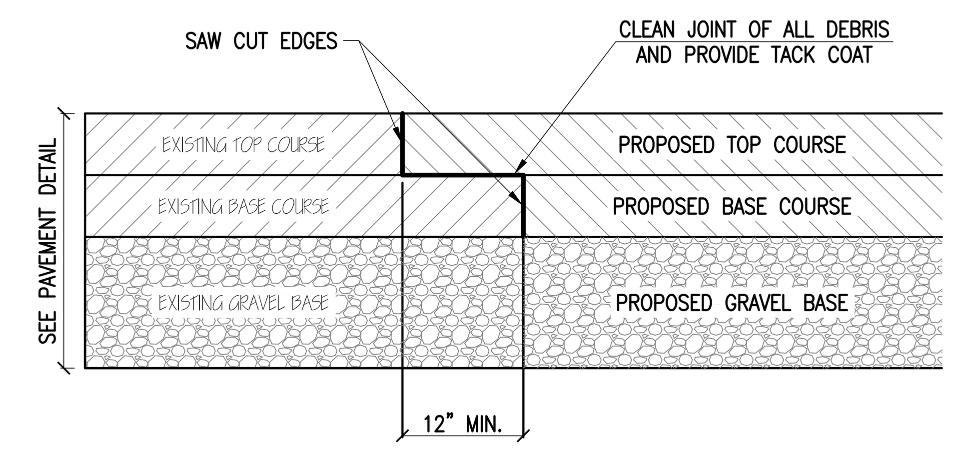
NOTE:
UNLESS OTHERWISE NOTED ON PLANS, CONTRACTION JOINTS TO BE 5'-0" O.C. AND EXPANSION JOINTS TO BE 40'-0" O.C. MAX., OR AT BACK OF CURB, CHANGE OF DIRECTION, OTHER WALK, UTILITY APPURTENANCE, OR FACE OF STRUCTURE.




## CONCRETE PAVEMENT SIDEWALK

NOT TO SCALE

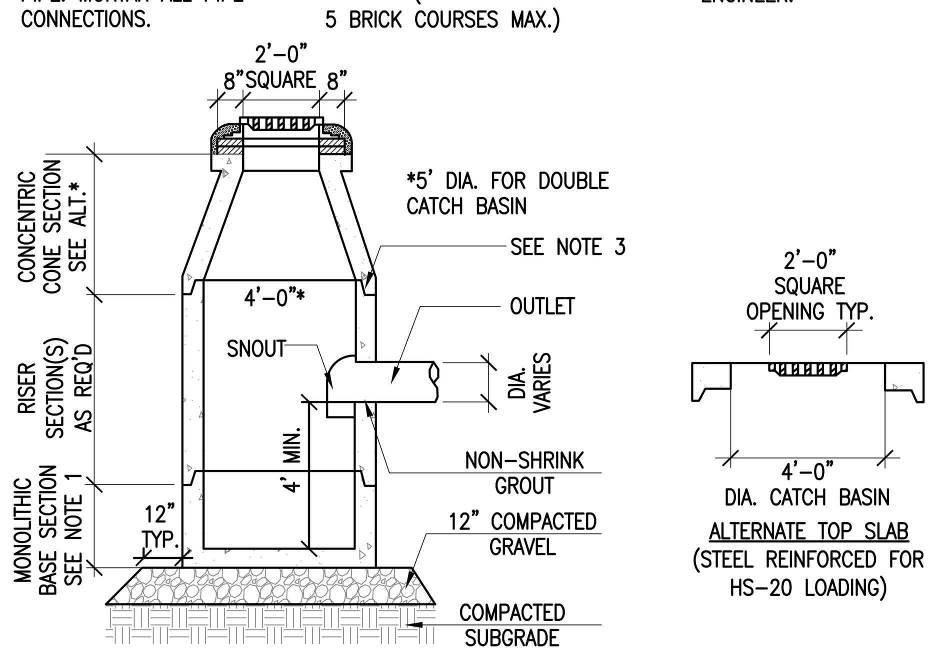
NOTES:
1. TACK COAT – PROVIDE EMULSIFIED ASPHALT WHICH CONFORMS TO THE REQUIREMENTS OF THE STATE SPECIFICATIONS, DILUTED WITH ONE PART WATER TO ONE ONE PART ASPHALT FOLLOWING AASHTO M140/ASTM D997, OR AASHTO M208/ASTM D2397, SS-1H, CSS-1, OR CSS-1H.




## PAVEMENT SAWCUT KEY DETAIL

NOT TO SCALE

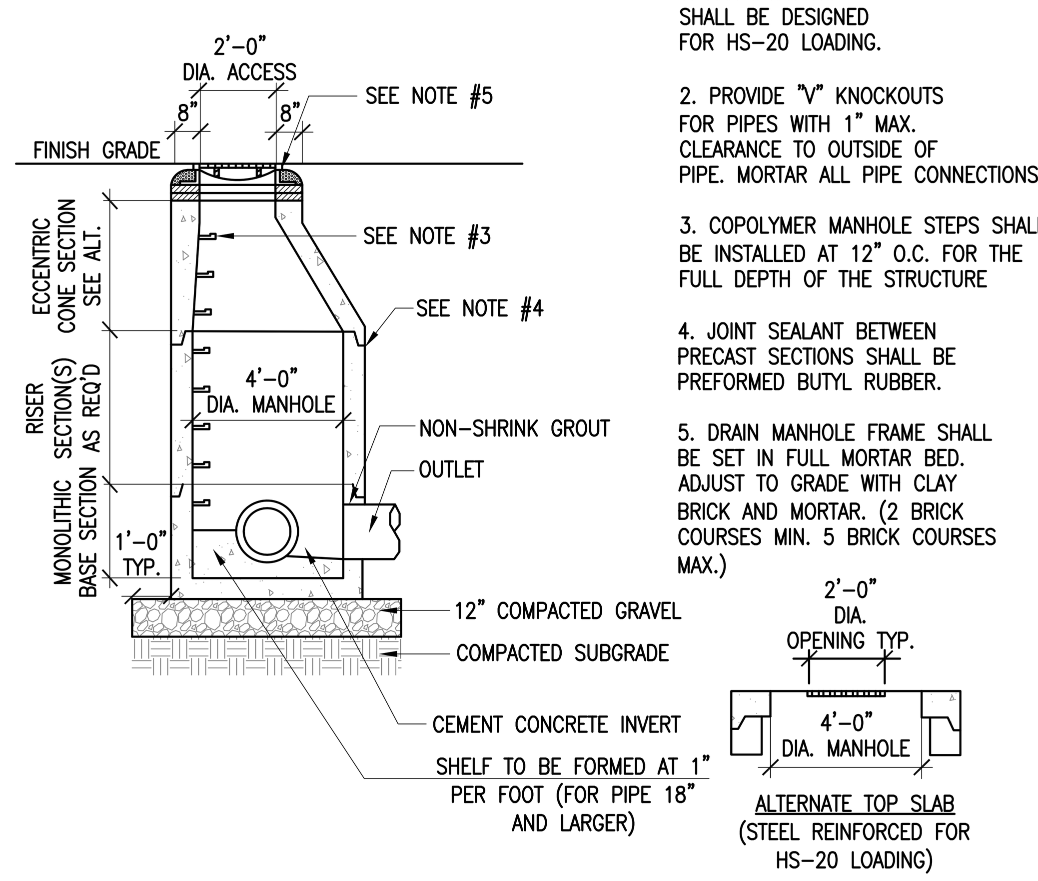
NOTES:
1. ALL SECTIONS SHALL BE DESIGNED FOR HS-20 LOADING.
2. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 1" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.
3. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
4. CATCH BASIN FRAME SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR. (2 BRICK COURSES MIN. 5 BRICK COURSES MAX.)
5. FRAME AND GRATE TO BE EQUAL TO LEBARON LK 120 (3 FLANGE) OR LK 121 (4 FLANGE) WITH SG-1 GRATE. DOUBLE FRAME AND GRATE SHALL BE LEBARON TYPE R-3531 B OR APPROVED EQUAL BY THE ENGINEER.




## CATCH BASIN

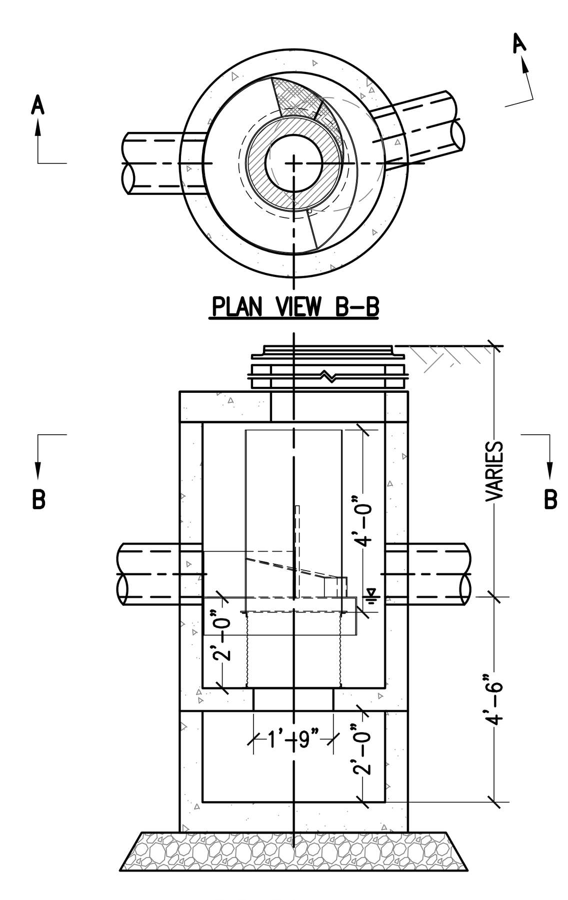
NOT TO SCALE

NOTES:
1. ALL SECTIONS SHALL BE DESIGNED FOR HS-20 LOADING.
2. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 1" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.
3. COPOLYMER MANHOLE STEPS SHALL BE INSTALLED AT 12" O.C. FOR THE FULL DEPTH OF THE STRUCTURE
4. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
5. DRAIN MANHOLE FRAME SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR. (2 BRICK COURSES MIN. 5 BRICK COURSES MAX.)




## DRAIN MANHOLE

NOT TO SCALE




## CONTECH CDS WATER QUALITY UNIT

NOT TO SCALE



REVISIONS

| | | |
|---|---|---|
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# SITE PLAN
100 DUCHAINE BOULEVARD
ASSESSORS MAP 133 LOT 67
ASSESSORS MAP 134 LOTS 5 & 462
NEW BEDFORD, MASSACHUSETTS

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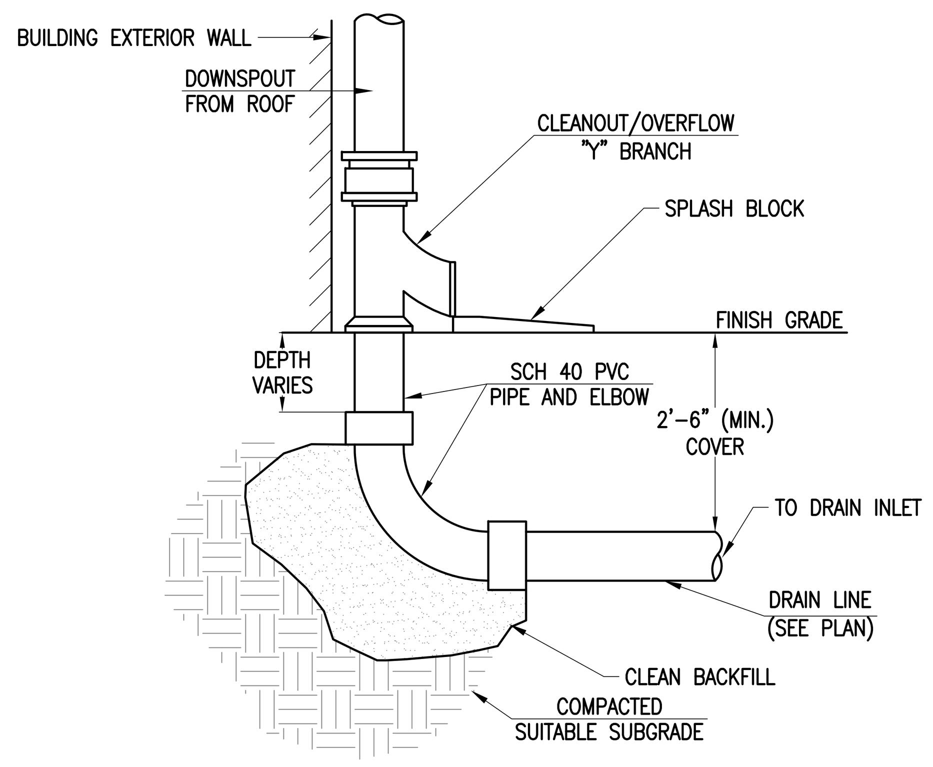
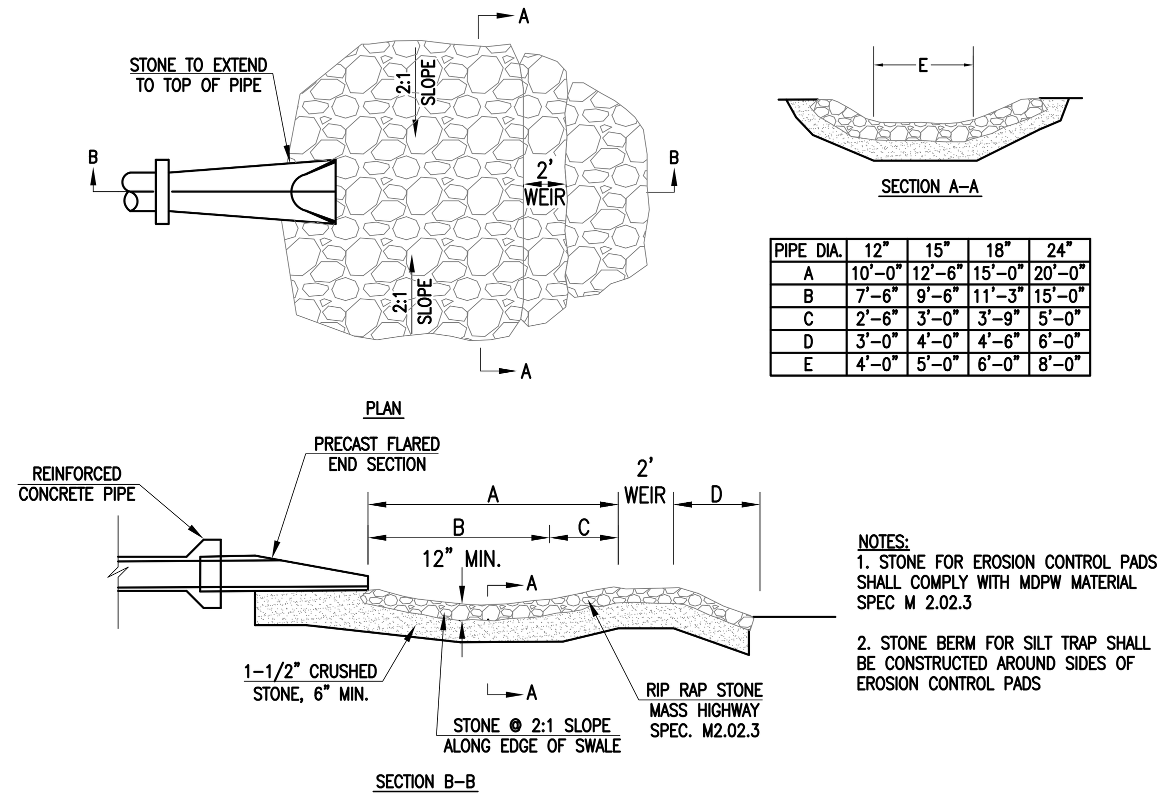
SHEET 20 OF 26




## DOWNSPOUT CONNECTION FROM ROOF

NOT TO SCALE

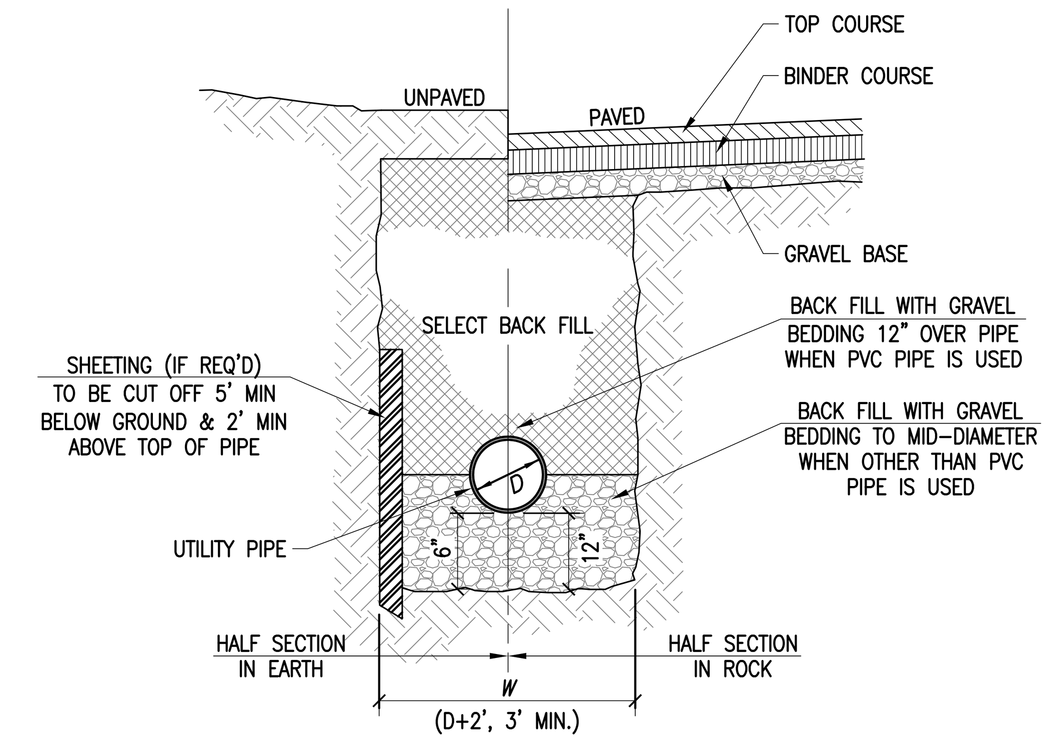



| PIPE DIA. | 12" | 15" | 18" | 24" |
|---|---|---|---|---|
| A | 10'-0" | 12'-6" | 15'-0" | 20'-0" |
| B | 7'-6" | 9'-6" | 11'-3" | 15'-0" |
| C | 2'-6" | 3'-0" | 3'-9" | 5'-0" |
| D | 3'-0" | 4'-0" | 4'-6" | 6'-0" |
| E | 4'-0" | 5'-0" | 6'-0" | 8'-0" |

NOTES:
1. STONE FOR EROSION CONTROL PADS SHALL COMPLY WITH MDPW MATERIAL SPEC M 2.02.3
2. STONE BERM FOR SILT TRAP SHALL BE CONSTRUCTED AROUND SIDES OF EROSION CONTROL PADS

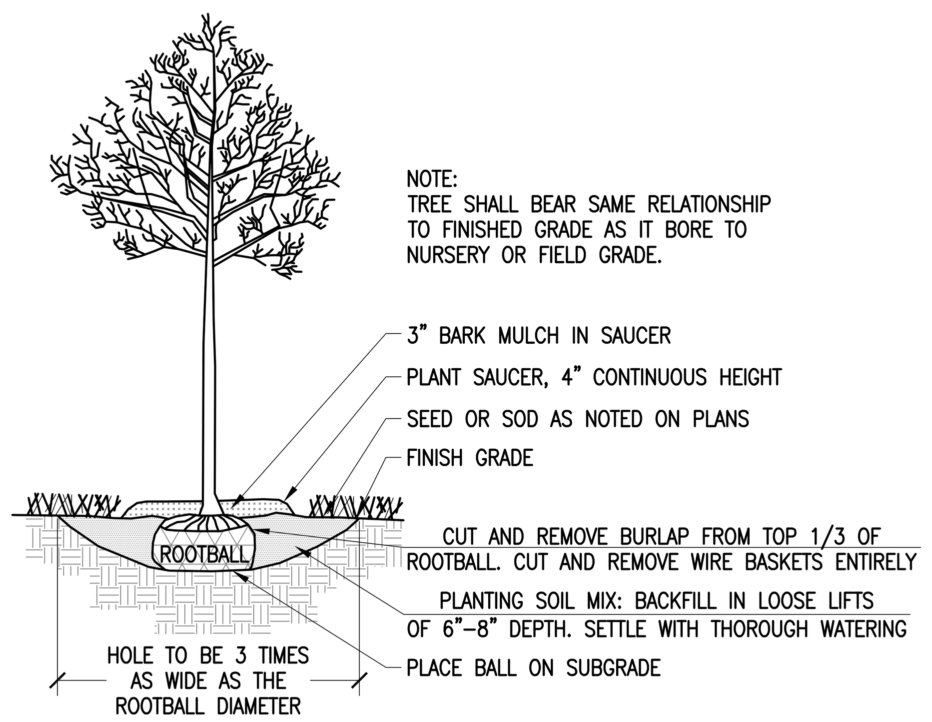
## FLARED END OUTLET

NOT TO SCALE



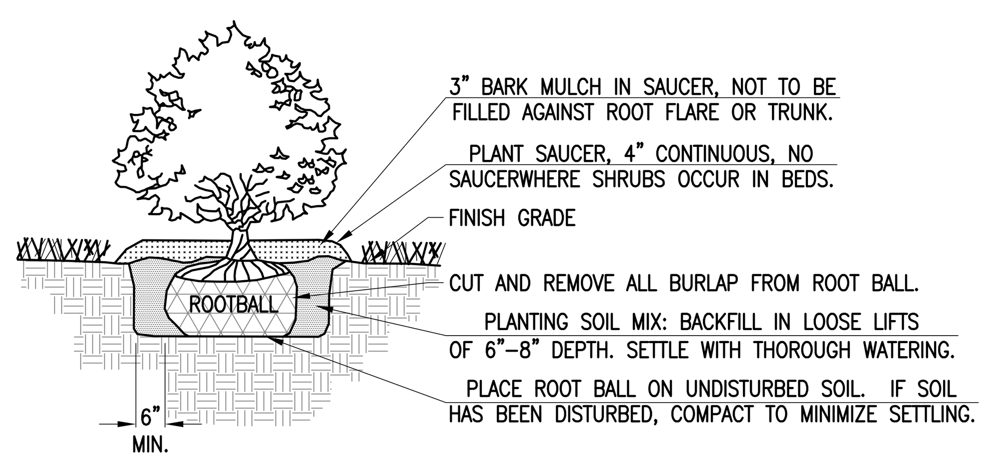

## UTILITY TRENCH

NOT TO SCALE




## TREE PLANTING

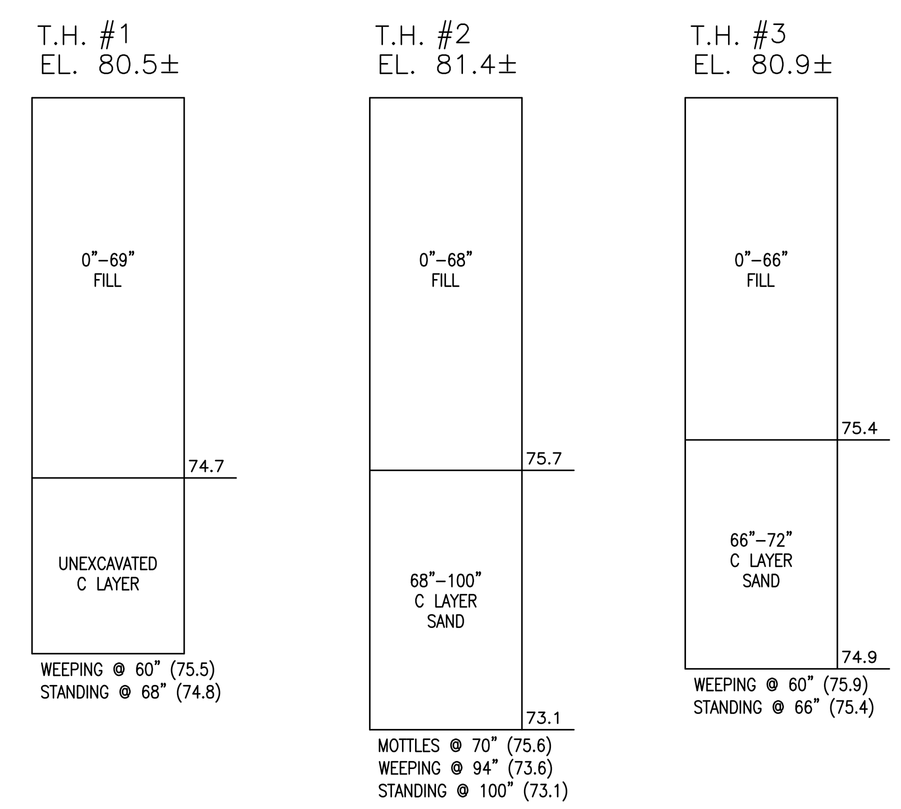
NOT TO SCALE




NOTES:
1. SHRUB SHALL BEAR SAME RELATIONSHIP TO FINISHED GRADE AS IT BORE TO NURSERY OR FIELD GRADE.
2. WHERE SHRUBS OCCUR IN GROUPINGS IN PLANT BEDS, PROVIDE 2' DEEP CONTINUOUS LOAM BED.

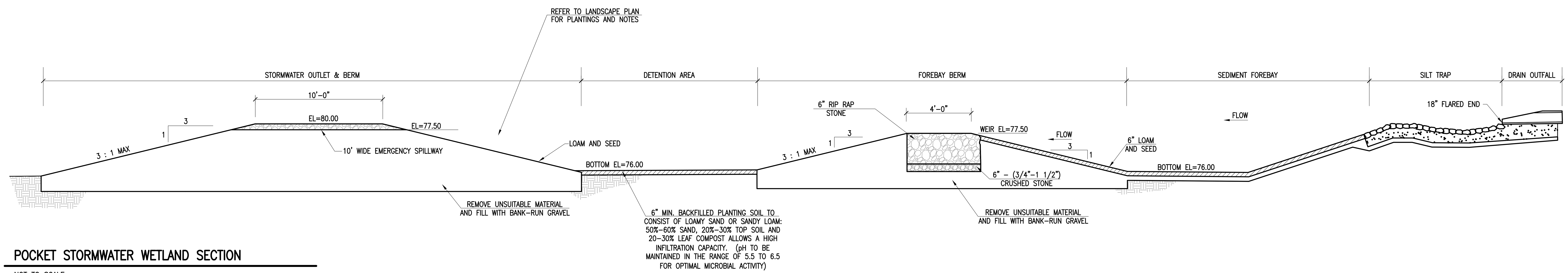
## SHRUB PLANTING

NOT TO SCALE




## SOIL PROFILES

NOT TO SCALE




## POCKET STORMWATER WETLAND SECTION

NOT TO SCALE



REVISIONS

| | | |
|---|---|---|
| 1 | 7/10/19 | CONSERVATION COMMENTS |
| 2 | 8/8/19 | PLANNING BOARD COMMENTS |
| 3 | 9/13/19 | CONSERVATION COMMENTS |
| 4 | 10/15/19 | PHASE I AND II |

COMMONWEALTH OF MASSACHUSETTS
CHRISTIAN ALBERT FARLAND
No. 47544
CIVIL
REGISTERED PROFESSIONAL ENGINEER

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OFFICES IN:
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- MARLBOROUGH
- WARWICK, RI

DRAWN BY: MJW
DESIGNED BY: CAF
CHECKED BY: CAF

# SITE PLAN

— 100 DUCHAINE BOULEVARD —
ASSESSORS MAP 133 LOT 67
ASSESSORS MAP 134 LOTS 5 & 462
NEW BEDFORD, MASSACHUSETTS

PREPARED FOR: PARALLEL PRODUCTS OF NEW ENGLAND
401 INDUSTRY ROAD
LOUISVILLE, KY 40208

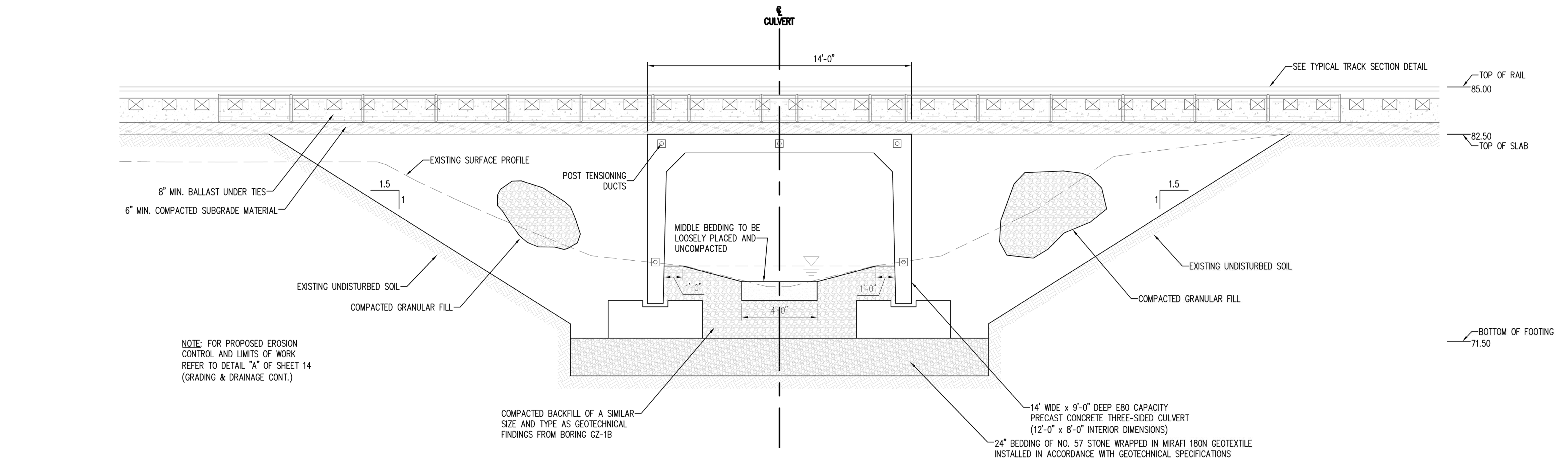
JULY 3, 2019

SCALE: AS NOTED

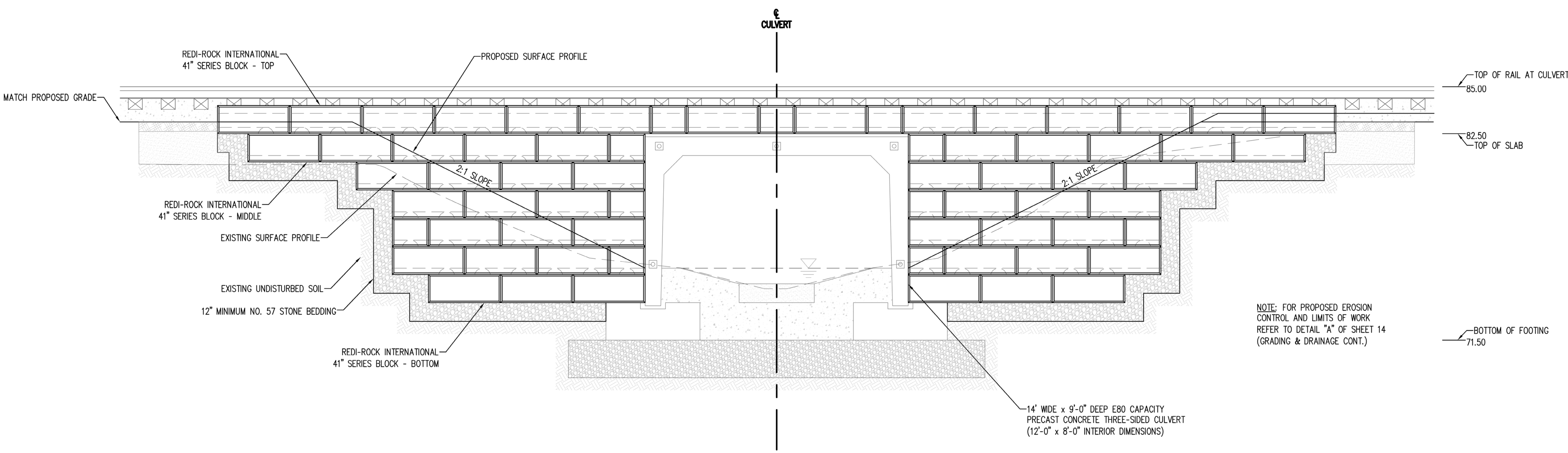
JOB NO. 15-500.2

LATEST REVISION: OCTOBER 15, 2019

DETAILS CONT.




STREAM CROSSING (SECTION A-A)




STREAM CROSSING (PROFILE VIEW)

TEC ASSOCIATES CONSULTING ENGINEERS
46 SAWYER STREET SOUTH PORTLAND, MAINE 04106



REVISIONS

| | | |
|---|---|---|
| 1 | 7/10/19 | CONSERVATION COMMENTS |
| 2 | 8/8/19 | PLANNING BOARD COMMENTS |
| 3 | 9/13/19 | CONSERVATION COMMENTS |
| 4 | 10/15/19 | PHASE I AND II |

COMMONWEALTH OF MASSACHUSETTS CHRISTIAN ALBERT FARLAND No. 47544 CIVIL REGISTERED PROFESSIONAL ENGINEER

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DRAWN BY: MJW
DESIGNED BY: CAF
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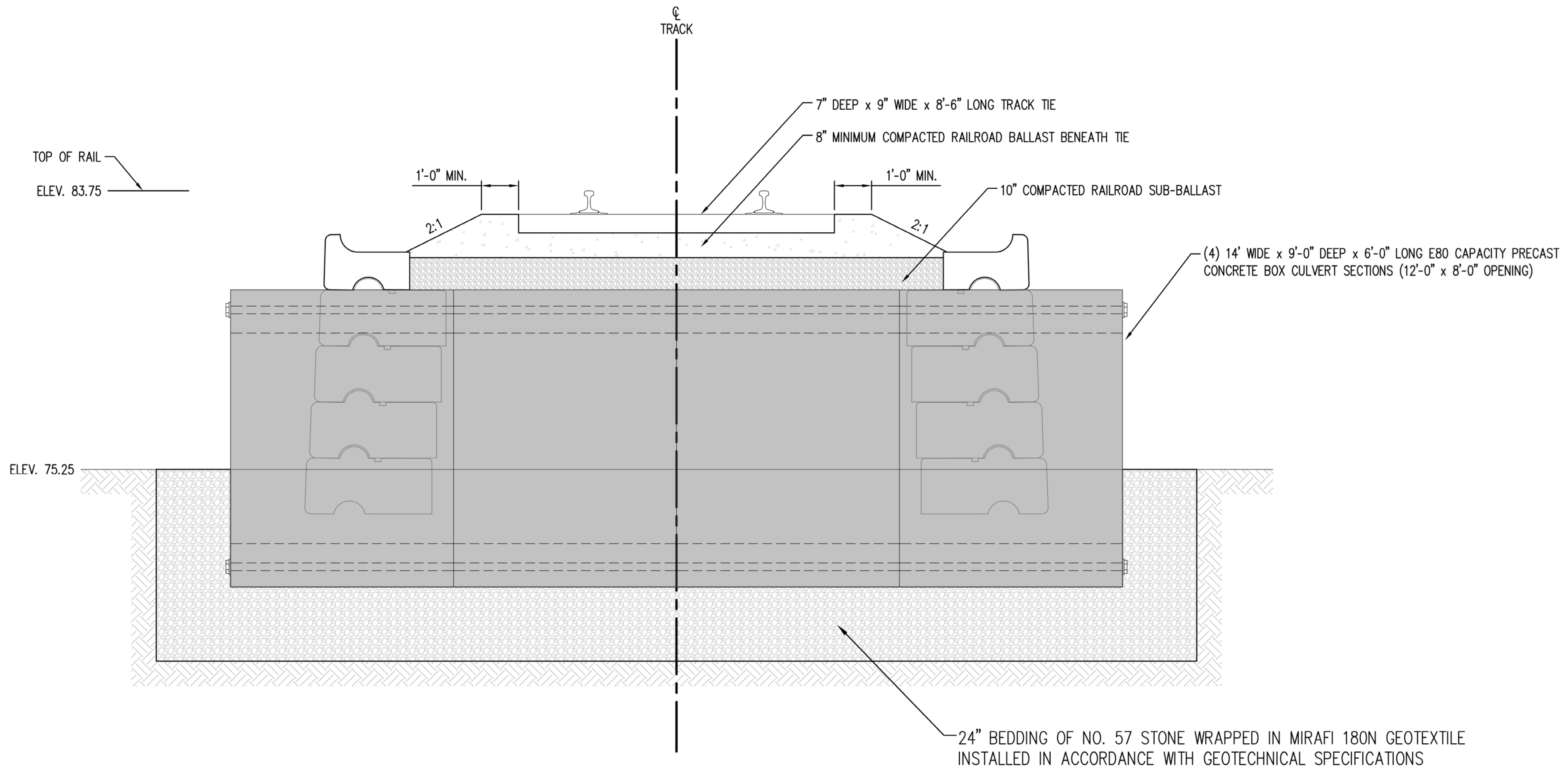
# SITE PLAN
100 DUCHAINE BOULEVARD
ASSESSORS MAP 133 LOT 67
ASSESSORS MAP 134 LOTS 5 & 462
NEW BEDFORD, MASSACHUSETTS

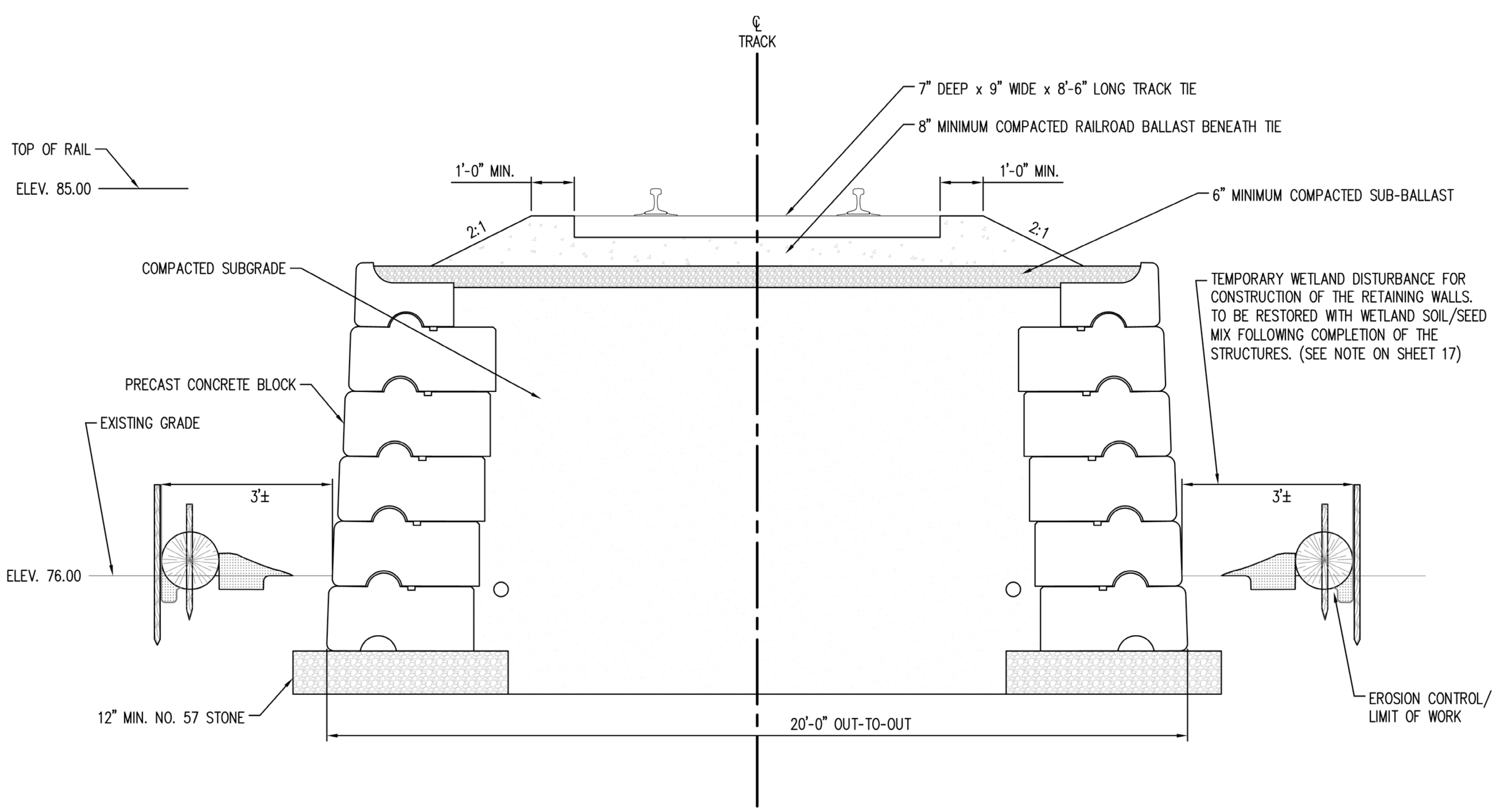
PREPARED FOR: PARALLEL PRODUCTS OF NEW ENGLAND
401 INDUSTRY ROAD
LOUISVILLE, KY 40208

JULY 3, 2019
SCALE: AS NOTED
JOB NO. 15-500.2
LATEST REVISION: OCTOBER 15, 2019

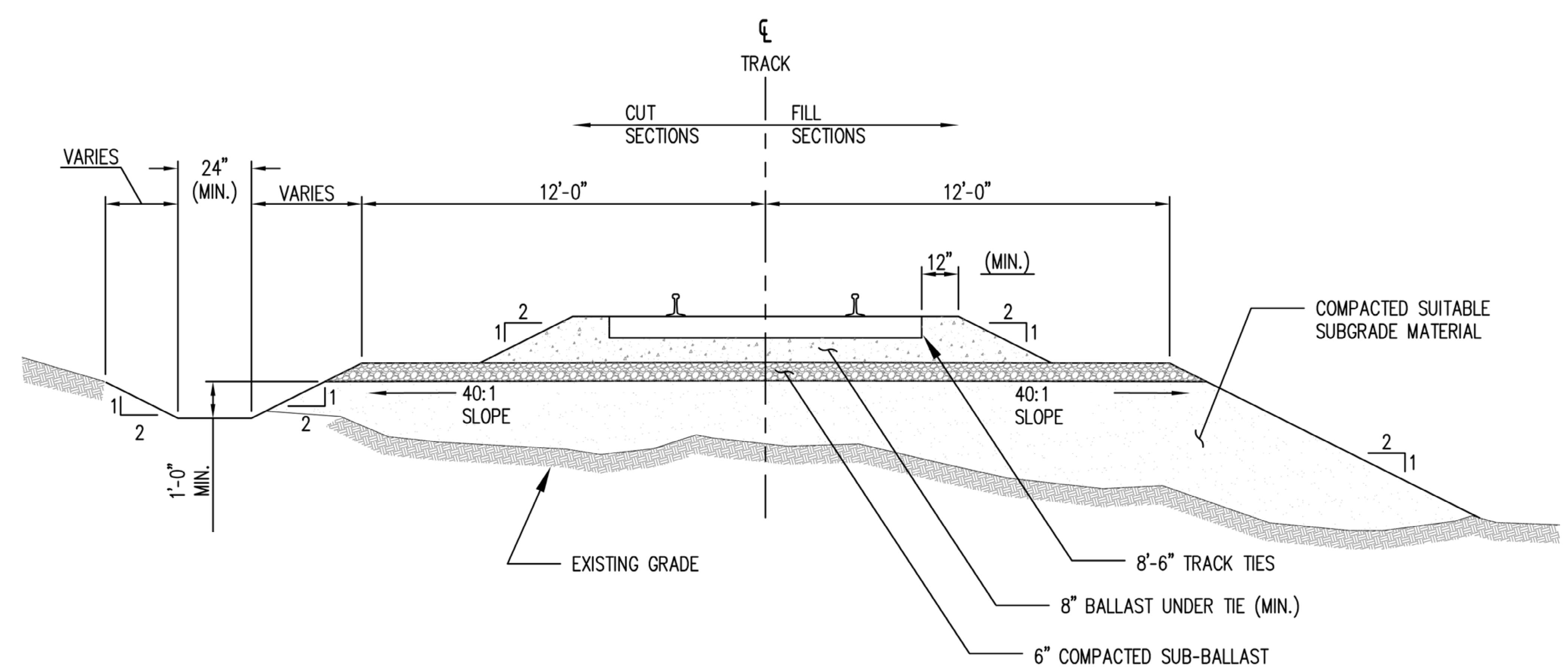
DETAILS
SHEET 22 OF 26




STREAM CROSSING (SECTION B-B)




WETLAND CROSSING - SECTION VIEW




TYPICAL CROSS SECTION - SINGLE RAIL

TEC ASSOCIATES CONSULTING ENGINEERS
46 SAWYER STREET SOUTH PORTLAND, MAINE 04106



REVISIONS

| | | |
|---|---|---|
| 1 | 7/10/19 | CONSERVATION COMMENTS |
| 2 | 8/8/19 | PLANNING BOARD COMMENTS |
| 3 | 9/13/19 | CONSERVATION COMMENTS |
| 4 | 10/15/19 | PHASE I AND II |

COMMONWEALTH OF MASSACHUSETTS
CHRISTIAN ALBERT FARLAND
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DRAWN BY: MJW
DESIGNED BY: CAF
CHECKED BY: CAF

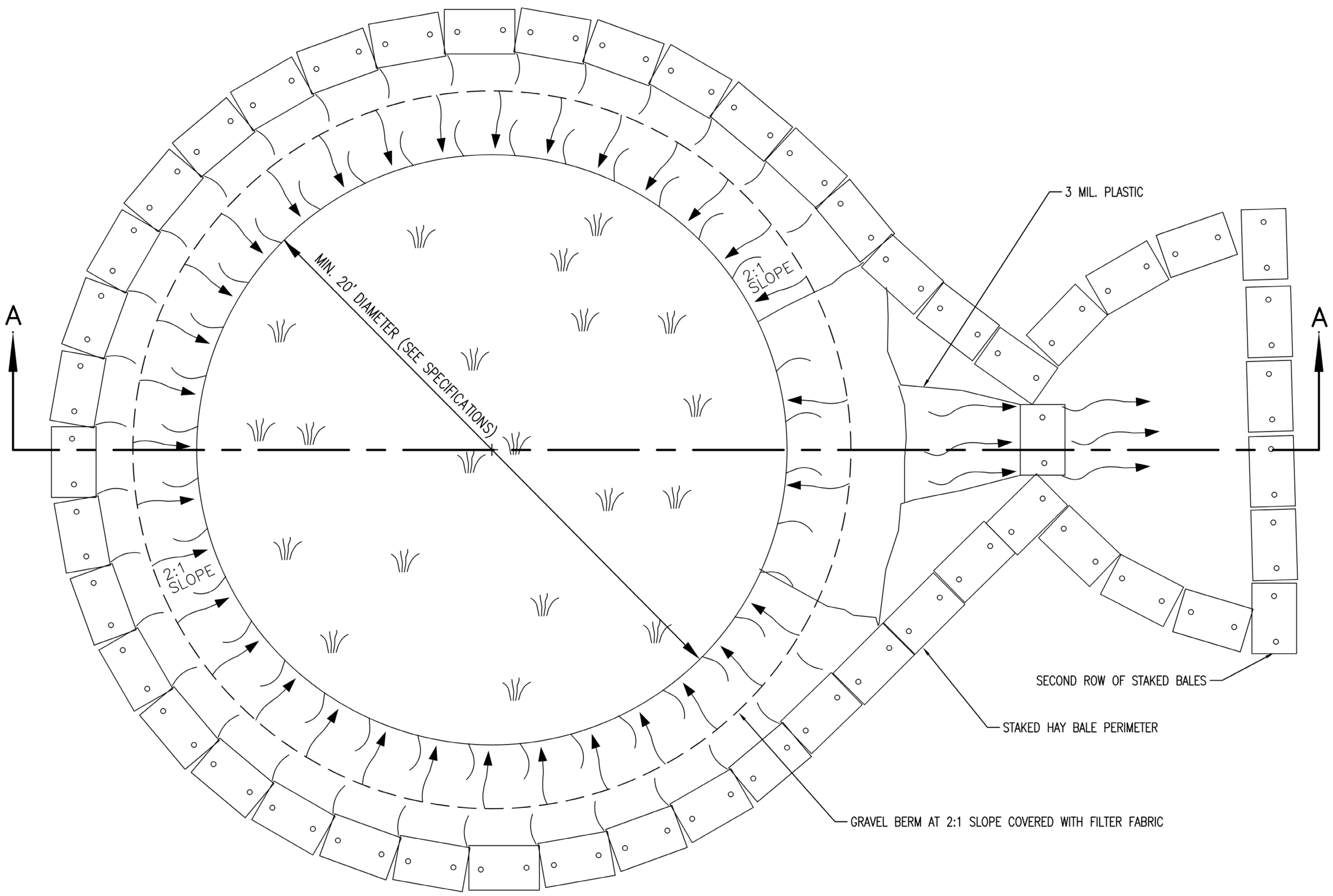
# SITE PLAN
## 100 DUCHAINE BOULEVARD
ASSESSORS MAP 133 LOT 67
ASSESSORS MAP 134 LOTS 5 & 462
NEW BEDFORD, MASSACHUSETTS

PREPARED FOR:
PARALLEL PRODUCTS OF NEW ENGLAND
401 INDUSTRY ROAD
LOUISVILLE, KY 40208

JULY 3, 2019
SCALE: AS NOTED
JOB NO. 15-500.2
LATEST REVISION:
OCTOBER 15, 2019

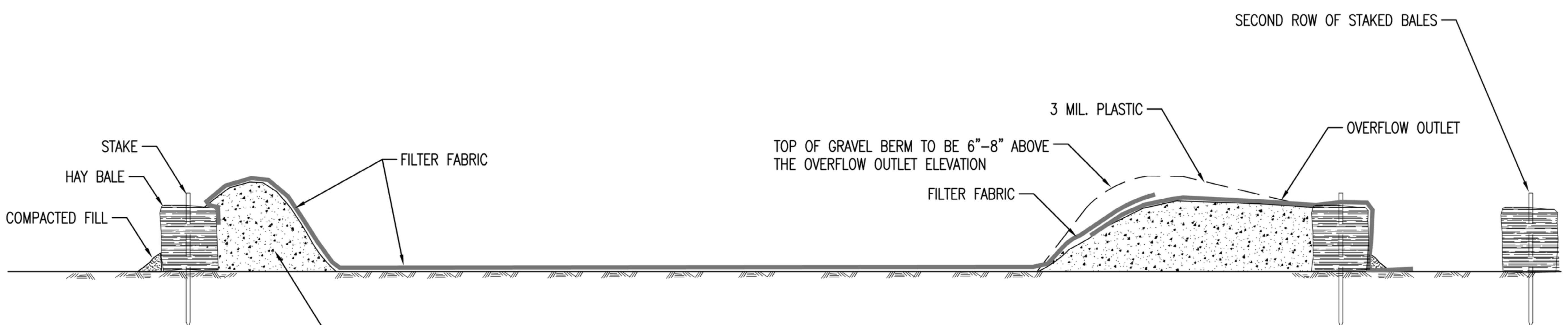
DETAILS

SHEET 23 OF 26




PLAN VIEW

N.T.S.




SECTION A-A

N.T.S.

COFFERDAM SEDIMENTATION BASIN

N.T.S.

PURPOSE & APPLICATIONS

1. A COFFERDAM SEDIMENTATION BASIN IS A SMALL, TEMPORARY PONDING AREA TO INTERCEPT SEDIMENT-LADEN RUNOFF FROM SMALL DISTURBED AREAS LONG ENOUGH TO ALLOW THE COARSER SEDIMENT PARTICLES TO SETTLE OUT.

SPECIFICATIONS

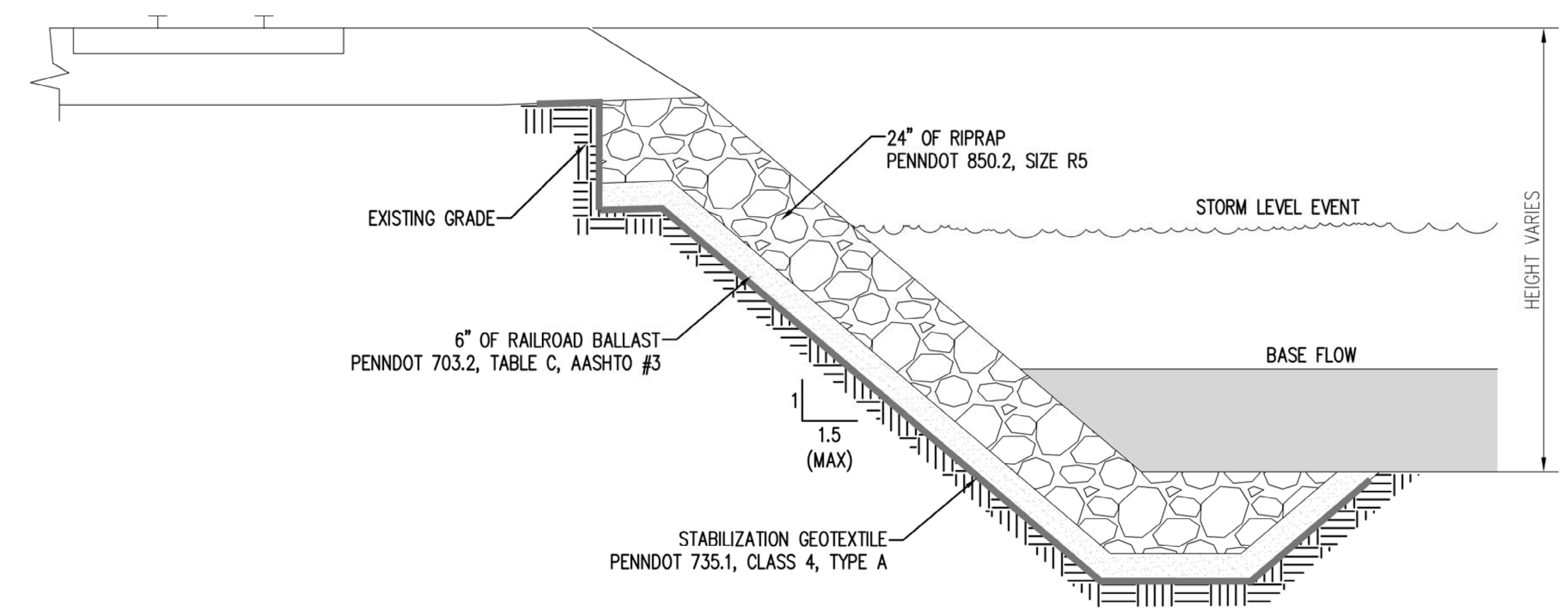
1. LOCATION: THE COFFERDAM SHALL BE LOCATED ON UNDISTURBED GROUND AND SO THAT IT CAN BE INSTALLED PRIOR TO CONSTRUCTION. COFFERDAMS MUST NOT BE LOCATED ANY CLOSER THAN 20 FEET FROM A PROPOSED BUILDING FOUNDATION IF THE COFFERDAM IS TO FUNCTION DURING CONSTRUCTION. LOCATE COFFERDAM TO OBTAIN MAXIMUM STORAGE BENEFIT FROM THE TERRAIN, FOR EASE OF CLEANING OUT AND DISPOSAL OF THE ACCUMULATED SEDIMENT.

2. COFFERDAM CLEAN OUT: SEDIMENT SHALL BE REMOVED AND THE COFFERDAM RESTORED TO ITS ORIGINAL DIMENSION WHEN THE SEDIMENTS HAVE ACCUMULATED TO 1/2 OF THE COFFERDAM'S DESIGN DEPTH. SEDIMENT REMOVED FROM THE COFFERDAM SHALL BE DEPOSITED IN A PROTECTED AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.

3. EXCAVATION: ALL EXCAVATION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION SHALL BE MINIMAL.

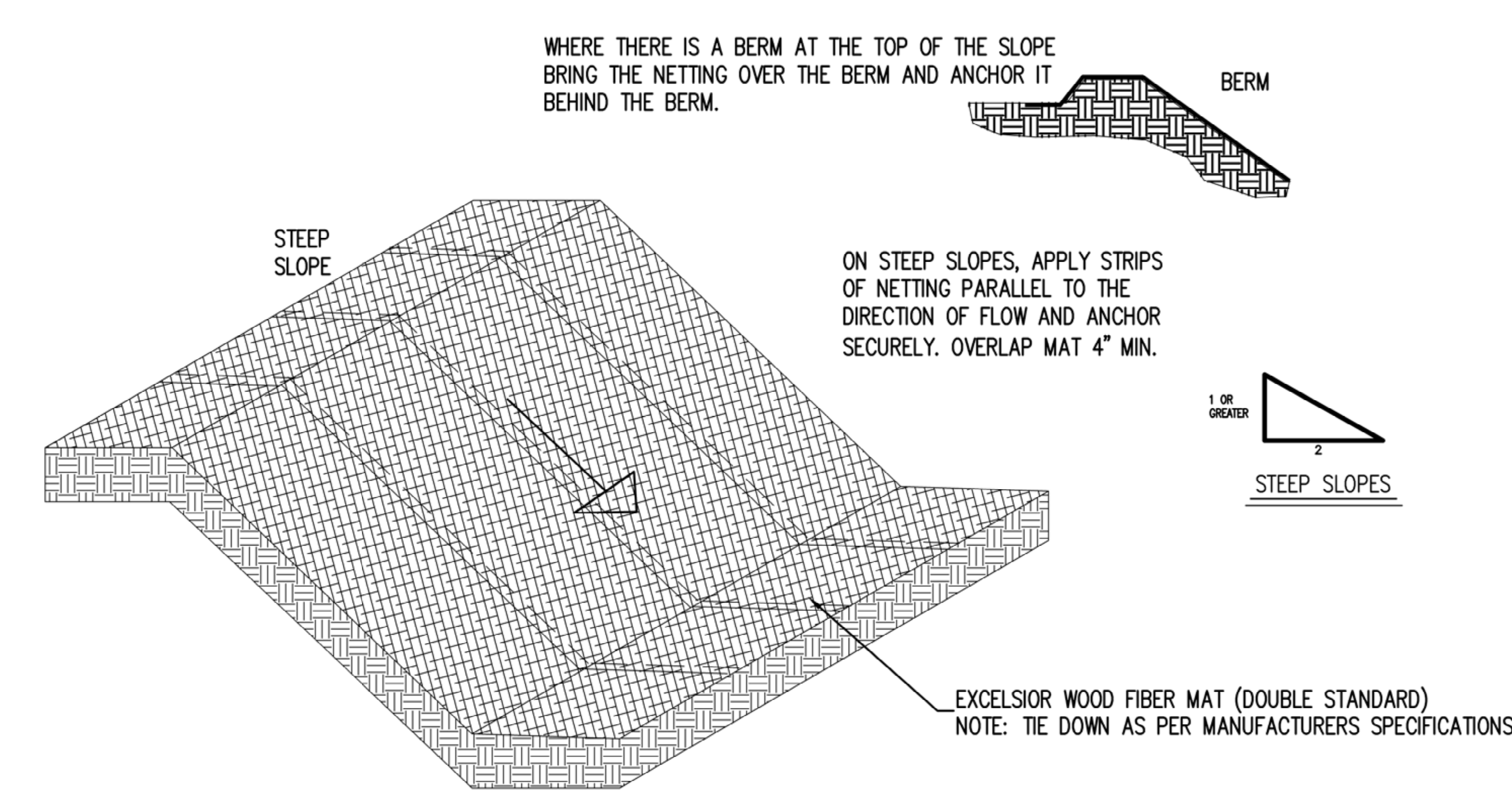
4. OUTLET: THE OUTLET SHALL BE DESIGNED, CONSTRUCTED AND MAINTAINED IN SUCH A MANNER THAT SEDIMENT DOES NOT LEAVE THE COFFERDAM AND THAT EROSION AT OR BELOW THE OUTLET DOES NOT OCCUR. THE COFFERDAM MUST OUTLET ONTO STABILIZED (PREFERABLY UNDISTURBED) GROUND, INTO A WATERCOURSE, STABILIZED CHANNEL, OR INTO A STORM DRAIN SYSTEM.

5. CAPACITY: THE CAPACITY SHALL BE SUFFICIENT TO CONTAIN ALL OF THE PUMPED WATER AND MATERIALS. THE RATE OF INFILTRATION INTO THE GROUND AND THROUGH ANY DIKES SHALL BE EQUAL TO OR GREATER THAN THE RATE OF PUMPING INTO THE BASIN. BASIN DIMENSIONS VARY WITH STORAGE CAPACITY NEEDED, MINIMUM INSIDE DIAMETER IS 20'.




STONE SLOPE PROTECTION

N.T.S.




EROSION CONTROL - STEEP SLOPES

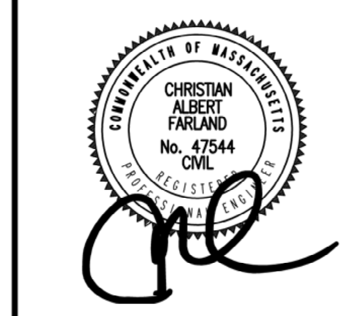
N.T.S.

TEC ASSOCIATES CONSULTING ENGINEERS
46 SAWYER STREET SOUTH PORTLAND, MAINE 04106



REVISIONS

| | | |
|---|---|---|
| 1 | 7/10/19 | CONSERVATION COMMENTS |
| 2 | 8/8/19 | PLANNING BOARD COMMENTS |
| 3 | 9/13/19 | CONSERVATION COMMENTS |
| 4 | 10/15/19 | PHASE I AND II |

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DRAWN BY: MJW
DESIGNED BY: CAF
CHECKED BY: CAF

SITE PLAN
100 DUCHAINE BOULEVARD
ASSESSORS MAP 133 LOT 67
ASSESSORS MAP 134 LOTS 5 & 462
NEW BEDFORD, MASSACHUSETTS

PREPARED FOR: PARALLEL PRODUCTS OF NEW ENGLAND
401 INDUSTRY ROAD
LOUISVILLE, KY 40208

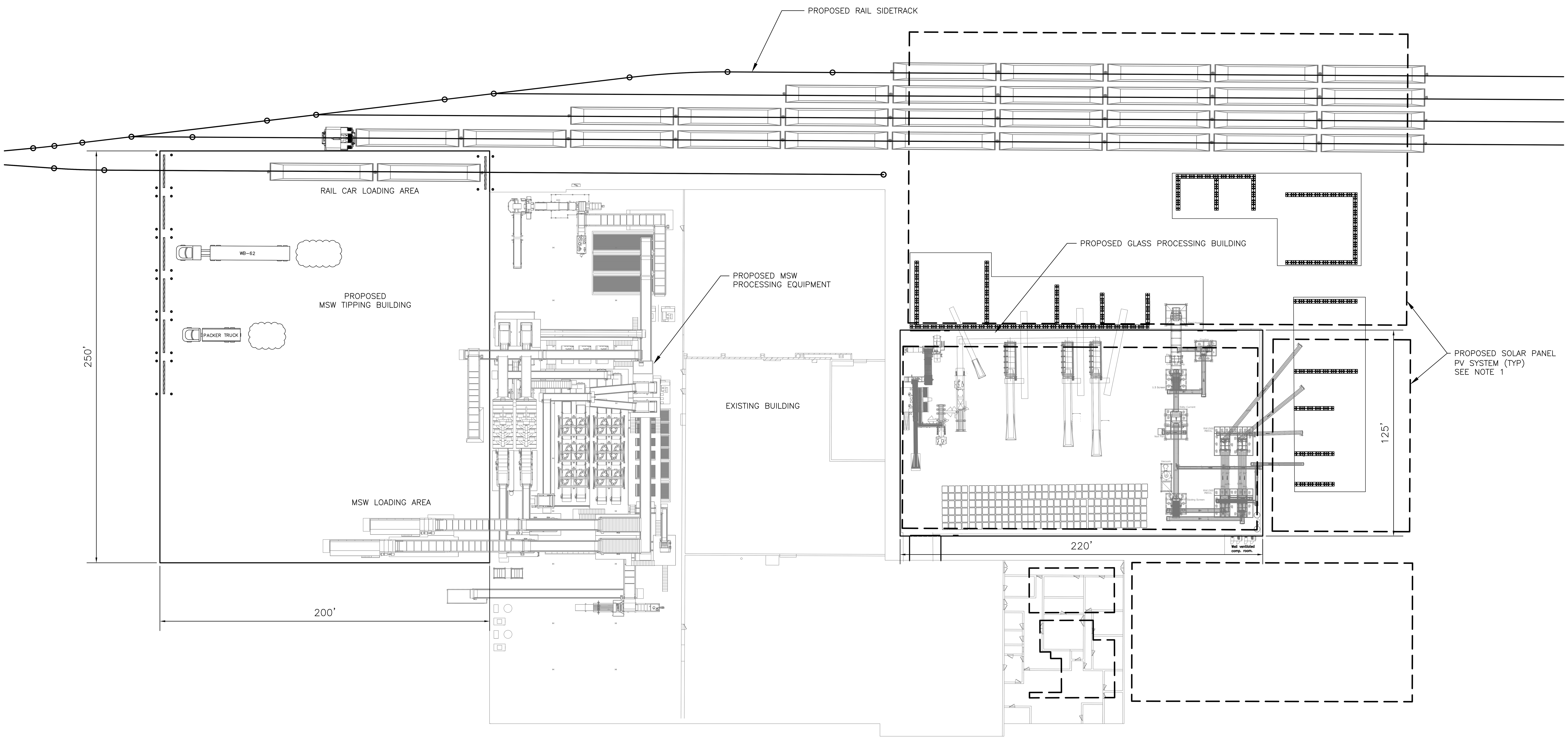
JULY 3, 2019

SCALE: AS NOTED

JOB NO. 15-500.2

LATEST REVISION:
OCTOBER 15, 2019

DETAILS




32' 0 32' 64'
BAR SCALE
1/32" = 1'-0"

NOTES:

1. ONLY THE OUTLINE OF THE PROPOSED SOLAR PANEL PV SYSTEM IS SHOWN FOR CLARITY. THE PROPOSED SOLAR PANELS ARE TO BE LOCATED ON AN ELEVATED CANOPY ABOVE EXISTING AND PROPOSED SITE FEATURES.


Green Seal Environmental, Inc.
114 State Road, Building B
Sagamore Beach, MA 02562
Tel: (508) 888-6034
Fax: (508) 888-1506
www.gseenv.com




Dimensions are as indicated.

Use of this plan constitutes acceptance of terms and conditions set forth in accompanying project documentation.

It is the responsibility of the user to confirm discrepancies with the Engineer prior to use.

REVISIONS

| NO. | DATE | COMMENT |
|---|---|---|
| A | 2/1/2019 | ISSUED FOR PERMITTING |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

PURPOSE:

PERMITTING

LOCUS:

NEW BEDFORD
INDUSTRIAL PARK
in
NEW BEDFORD,
MASSACHUSETTS

PREPARED FOR:

PARALLEL PRODUCTS, LLC

DRAWING TITLE:

BUILDING LAYOUT
TIPPING, MSW PROCESSING,
GLASS PROCESSING

| CAD TECH: | CHECKED BY: |
|---|---|
| T. JANICKI | G. WIRSEN |
| ENGINEER: | DATE: |
| W. HALL | 2/1/2019 |
| | SCALE: 1/32" =1'-0" |
| | SHEET: C-3 |

ATTACHMENT 9

RAIL CAR MOVEMENTS

MASS COASTAL
MASSACHUSETTS COASTAL RAILROAD

Operations
Maintenance of Way
Signal and Communications

Parallel Products
100 Duchaine Boulevard
New Bedford, MA 02745
Attention: Mr. Timothy Cusson

July 22nd, 2019

**Project Description: Proposed Recycled Glass and MSW Railcar Loading Tracks**

Project Location: New Bedford, MA

Tim,

I have reviewed the Rail Movement Study that was prepared by Green Seal Environmental dated 5/14/19. Mass Coastal (MC) takes no exception to the proposed "inter-plant" switching of railcars to facilitate loading. Please take note that the Track Mobile that is owned by Parallel Products is not permitted to operate past the split-rail derail that will be located past the clearance point of the mainline turnout.

MC currently operates MC-4 to New Bedford Tuesdays and Thursdays but is prepared to service the facility up to 6 days per week once traffic levels demand it. The train operates to New Bedford and is on duty 7AM to 7PM. Parallel Products would typically serviced between 10-11AM.

As you are aware, the South Coast Rail Project is underway, and frankly one bi-product will be increased speeds. Consequently, MC may be able to serve Parallel daily.

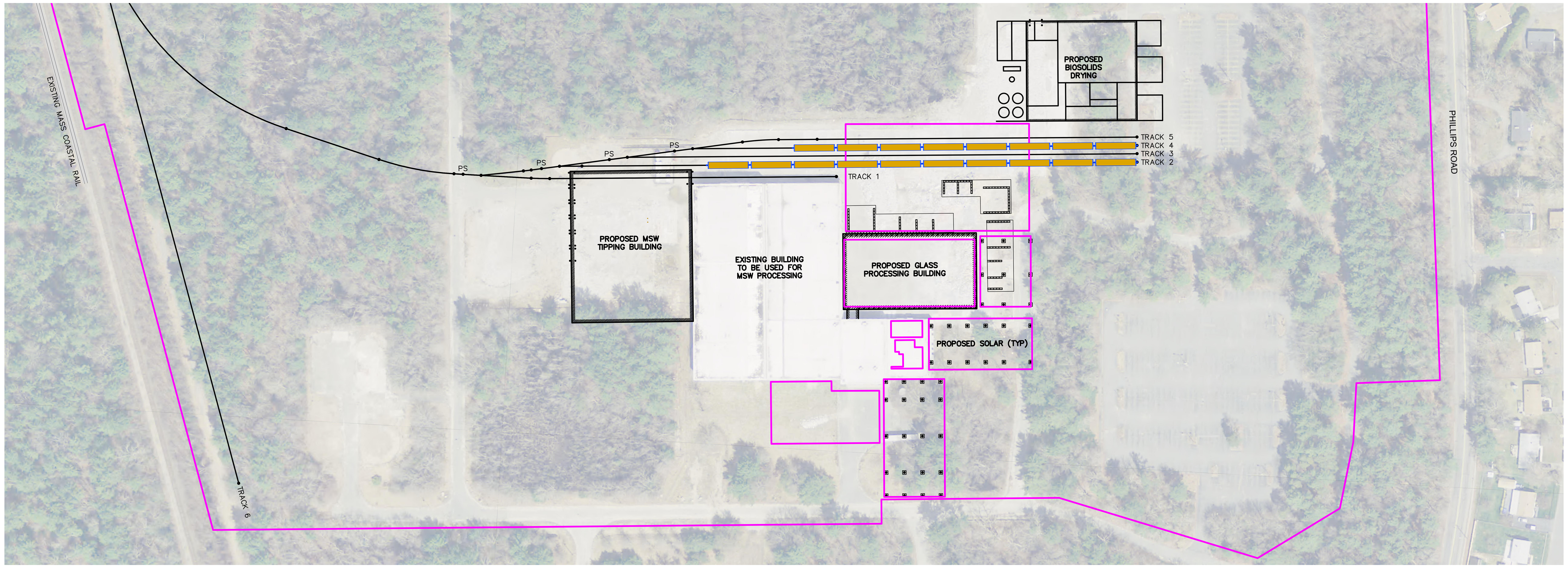
MC works with it's Class I partner, CSX Transportation for its connection to the National Rail Network. MC will work with the CSX startup team to assure that their train schedules are prepared for the traffic demand.

Should you have any further questions please contact me directly.

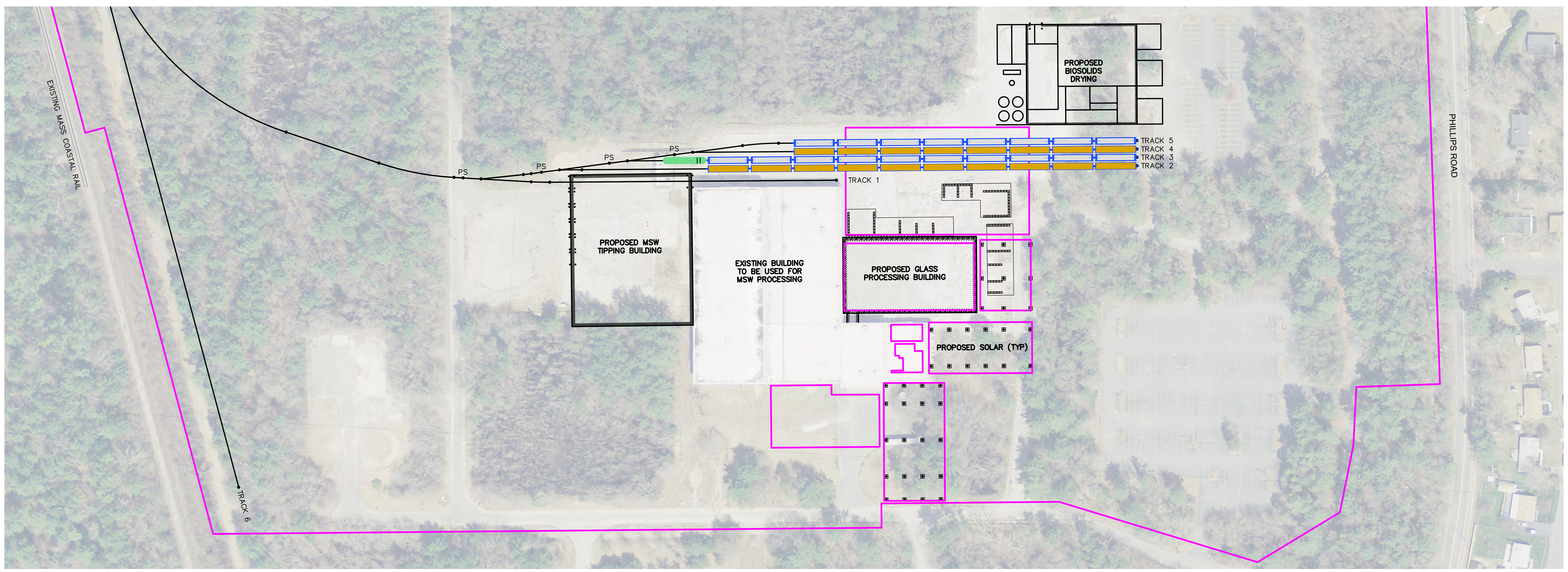
P. Christopher Podgurski

President & COO

cpodgurski@masscoastal.com
Tel: 508-291-7116



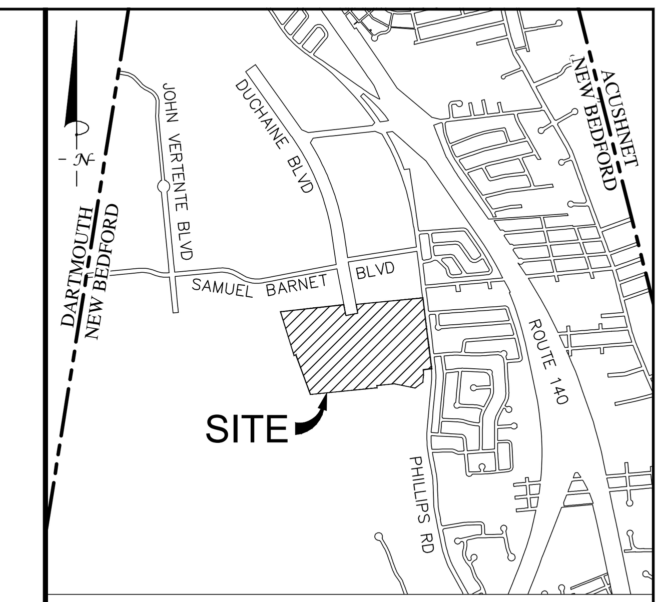

INITIAL CONDITIONS
10 FILLED RAIL CARS ON TRACK 2
8 FILLED RAIL CARS ON TRACK 4




STEP 1
MASS COASTAL DELIVERS 10 EMPTY RAIL CARS TO TRACK 3 AND
8 EMPTY RAIL CARS TO TRACK 5

LEGEND
EMPTY RAIL CAR
FULL RAIL CAR
LOCOMOTIVE
RAIL CAR MOVER
PS POINT OF SWITCH

100' 0 100' 200'
BAR SCALE
1" = 100'




LOCUS MAP NOT TO SCALE

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Fax: (508) 888-1506
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REVISIONS

| NO. | DATE | COMMENT |
|---|---|---|
| | | |

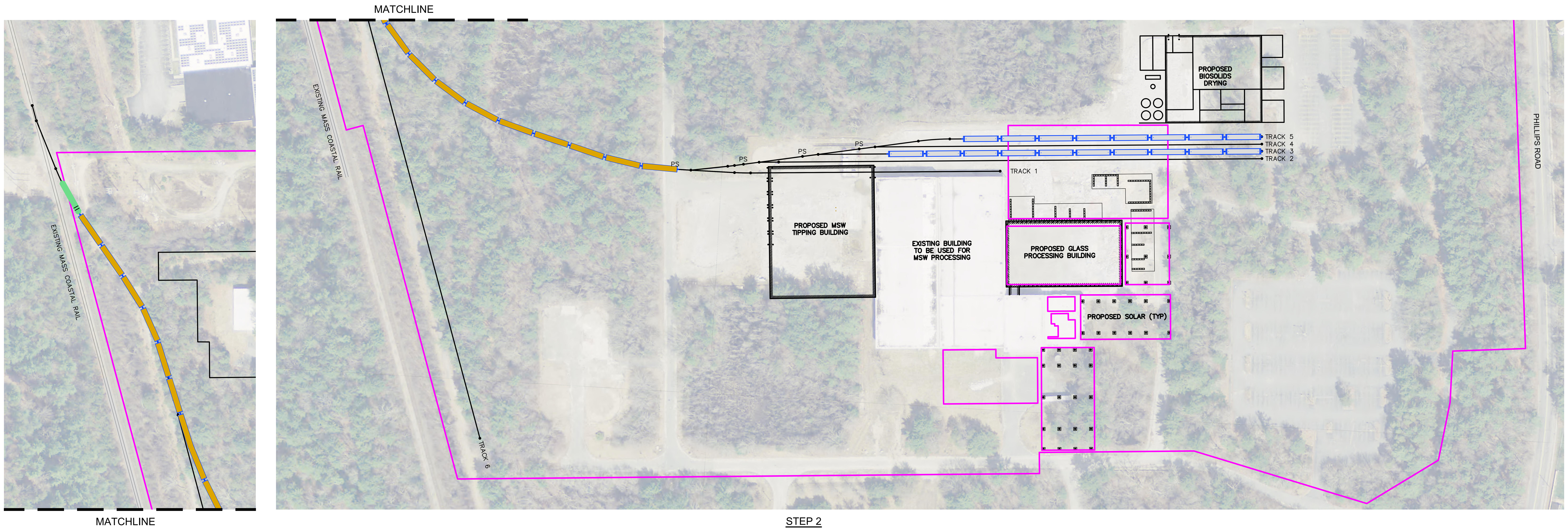
PURPOSE:
SITE ASSIGNMENT

LOCUS:
100 DUCHAINE BOULEVARD
NEW BEDFORD,
MASSACHUSETTS

PREPARED FOR:
PARALLEL PRODUCTS, LLC

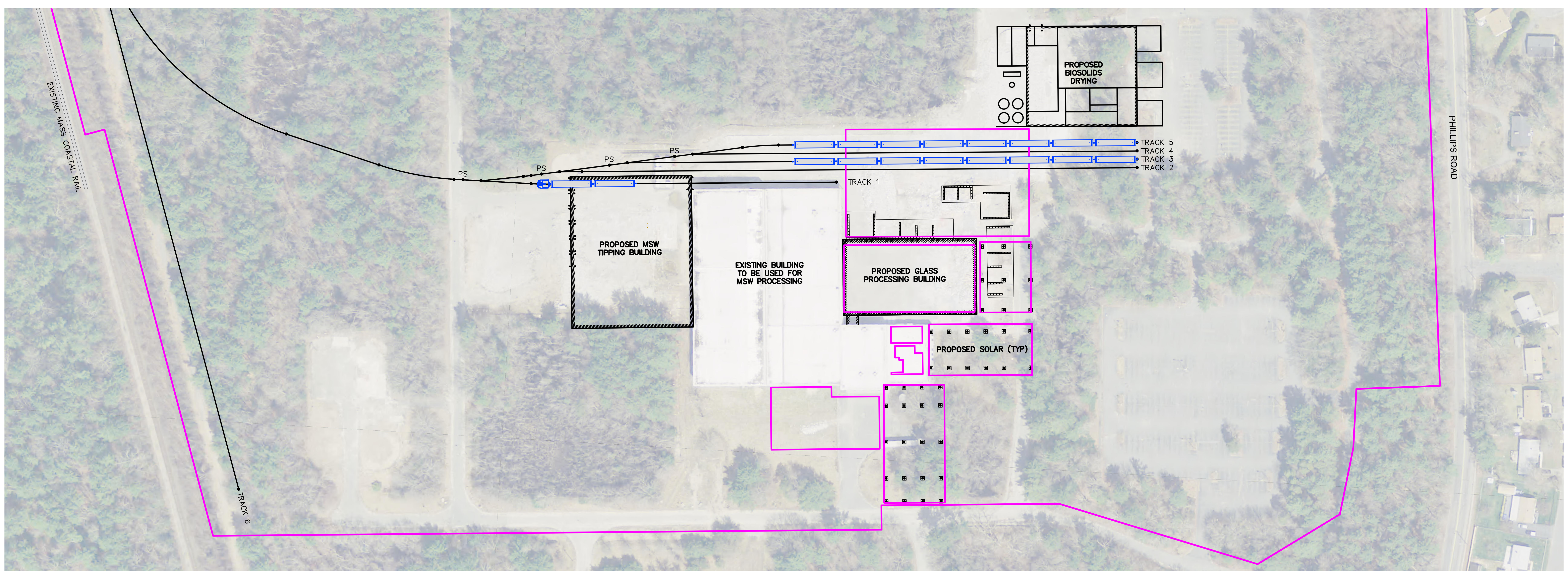
DRAWING TITLE:
RAIL CAR MOVEMENTS

CAD TECH: T. JANICKI
CHECKED BY:
ENGINEER: W. HALL
DATE: 5/14/2019
SCALE: 1"=100'
SHEET: 1 of 7




STEP 2

MASS COASTAL LEAVES SITE WITH 18 FULL CARS
(10 FROM TRACK 2 AND 8 FROM TRACK 4)



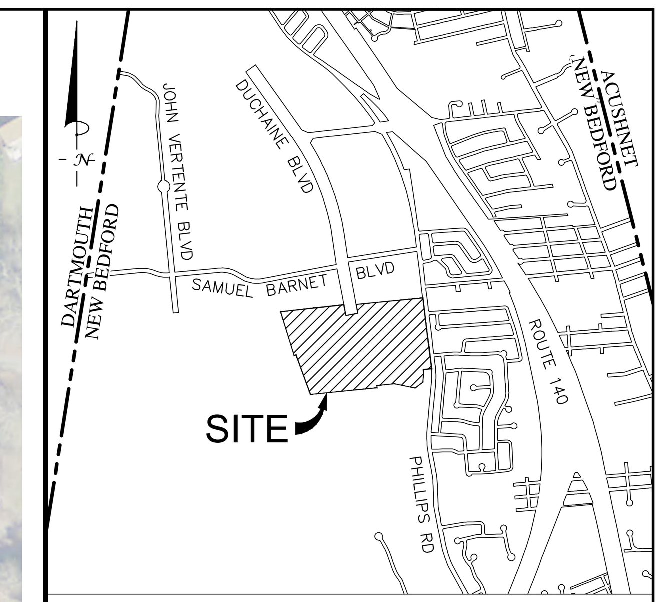

STEP 3

PPNE MOVES 2 EMPTY RAIL CARS FROM TRACK 3 TO BUILDING

LEGEND

EMPTY RAIL CAR
FULL RAIL CAR
LOCOMOTIVE
RAIL CAR MOVER
PS POINT OF SWITCH

100' 0 100' 200'
BAR SCALE
1" = 100'




LOCUS MAP NOT TO SCALE

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REVISIONS

| NO. | DATE | COMMENT |
| --- | --- | --- |
| | | |

PURPOSE:

SITE ASSIGNMENT

LOCUS:

100 DUCHAINE BOULEVARD
NEW BEDFORD,
MASSACHUSETTS

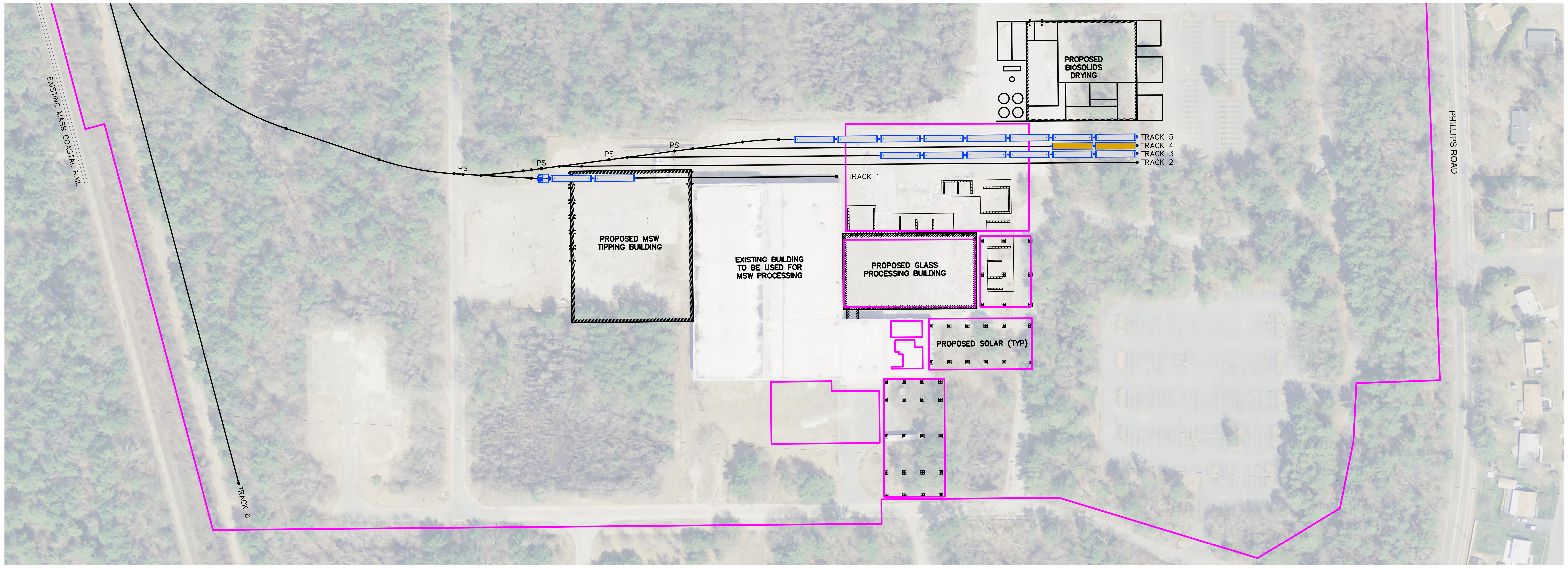
PREPARED FOR:

PARALLEL PRODUCTS, LLC

DRAWING TITLE:

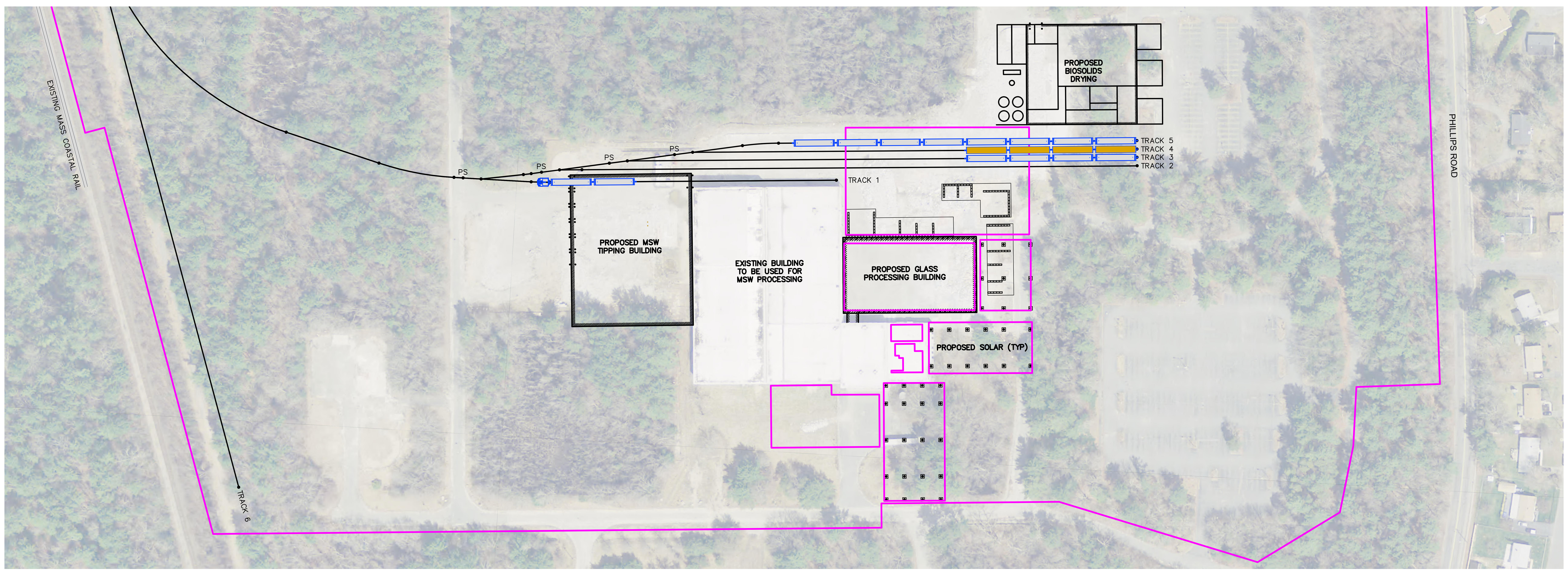
RAIL CAR MOVEMENTS

| CAD TECH: | CHECKED BY: |
| --- | --- |
| T. JANICKI | |
| ENGINEER: W. HALL | DATE: 5/14/2019 |
| | SCALE: 1"=100' |
| | SHEET: 2 of 7 |




STEP 4

PPNE MOVES 2 FULL CARS FROM BUILDING TO TRACK 4
PPNE MOVES 2 EMPTY CARS FROM TRACK 3 TO BUILDING



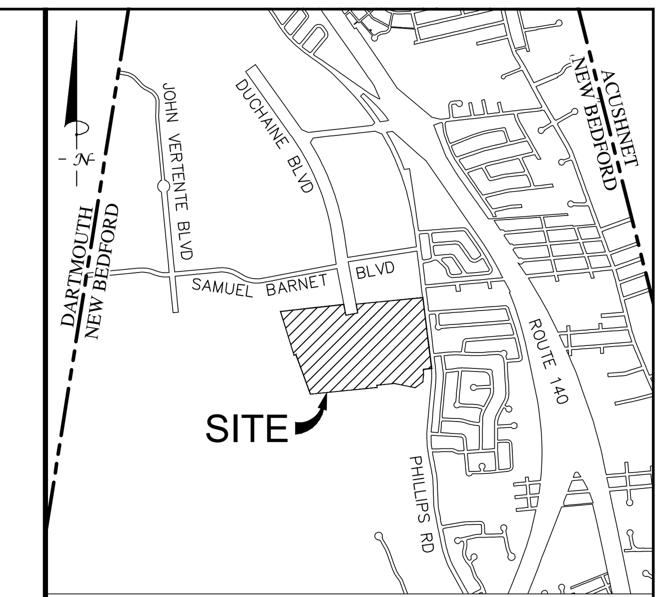

STEP 5

PPNE MOVES 2 FULL CARS FROM BUILDING TO TRACK 4
PPNE MOVES 2 EMPTY CARS FROM TRACK 3 TO BUILDING

LEGEND

EMPTY RAIL CAR
FULL RAIL CAR
LOCOMOTIVE
RAIL CAR MOVER
PS POINT OF SWITCH

100' 0 100' 200'
BAR SCALE
1" = 100'




LOCUS MAP NOT TO SCALE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REVISIONS

| NO. | DATE | COMMENT |
|---|---|---|

PURPOSE:

SITE ASSIGNMENT

LOCUS:

100 DUCHAINE BOULEVARD
NEW BEDFORD,
MASSACHUSETTS

PREPARED FOR:

PARALLEL PRODUCTS, LLC

DRAWING TITLE:

RAIL CAR MOVEMENTS

CAD TECH: T. JANICKI

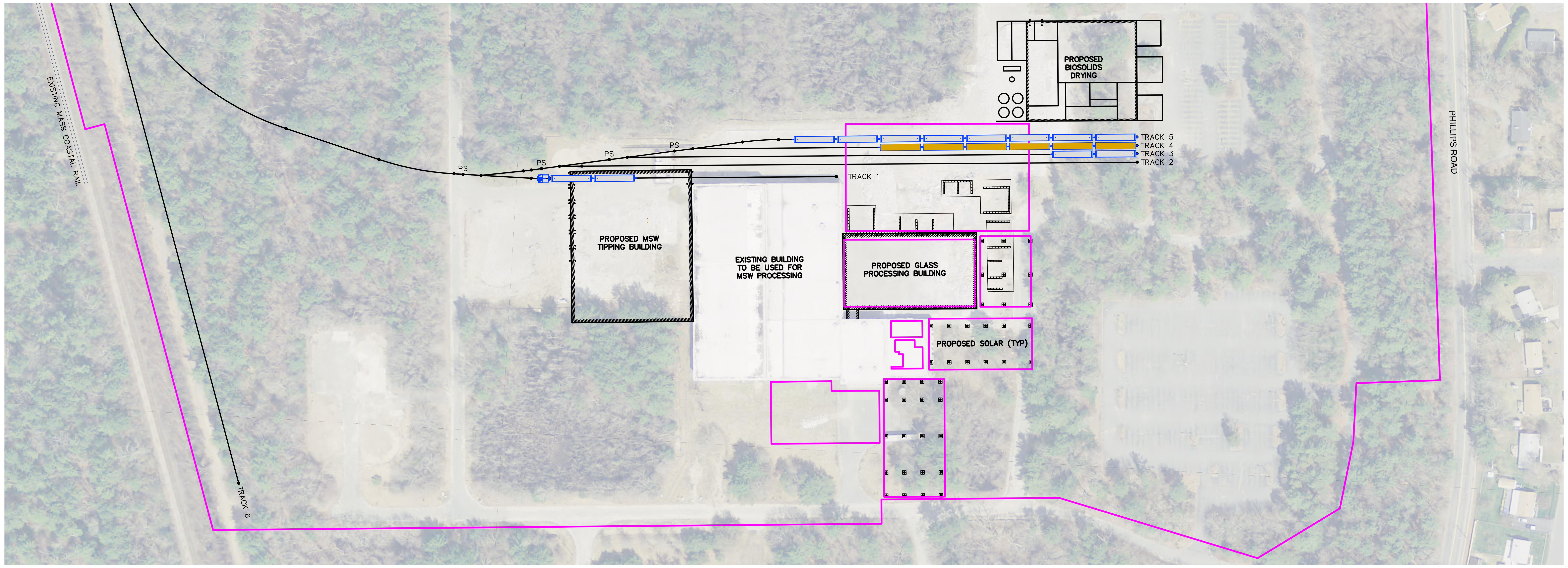
CHECKED BY:

ENGINEER: W. HALL

DATE: 5/14/2019

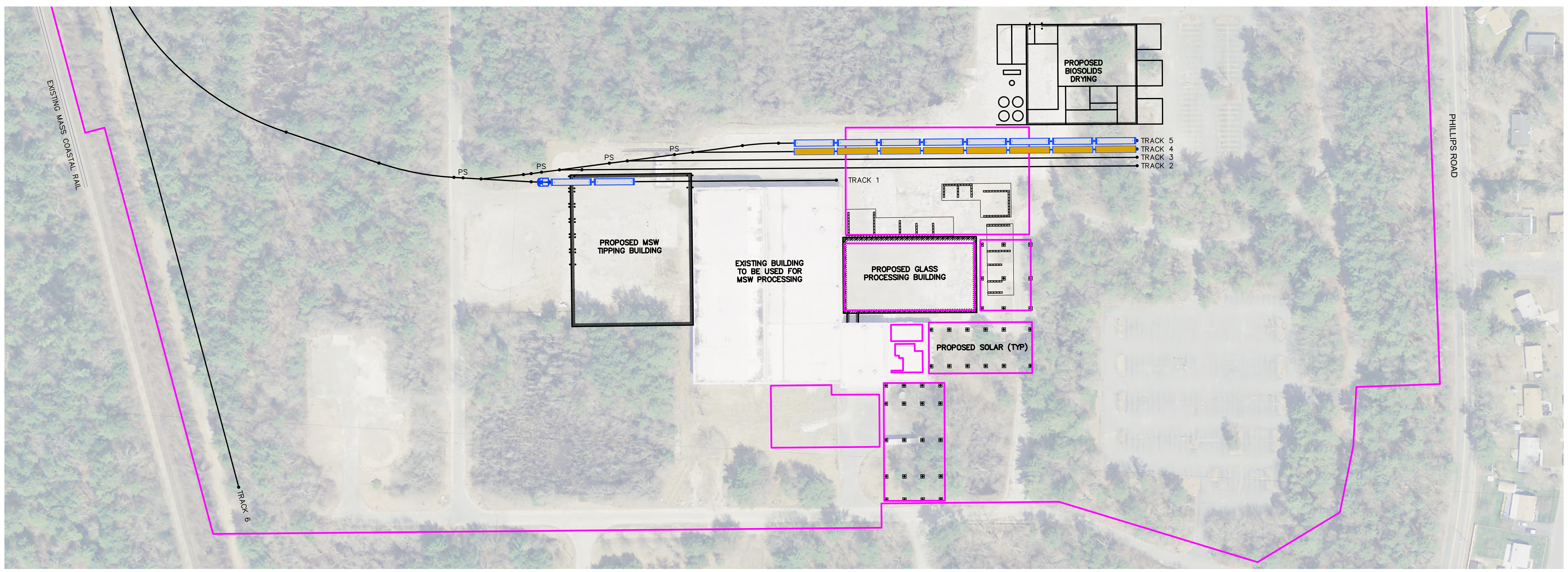
SCALE: 1"=100'

SHEET: 3 of 7




STEP 6

PPNE MOVES 2 FULL CARS FROM BUILDING TO TRACK 4
PPNE MOVES 2 EMPTY CARS FROM TRACK 3



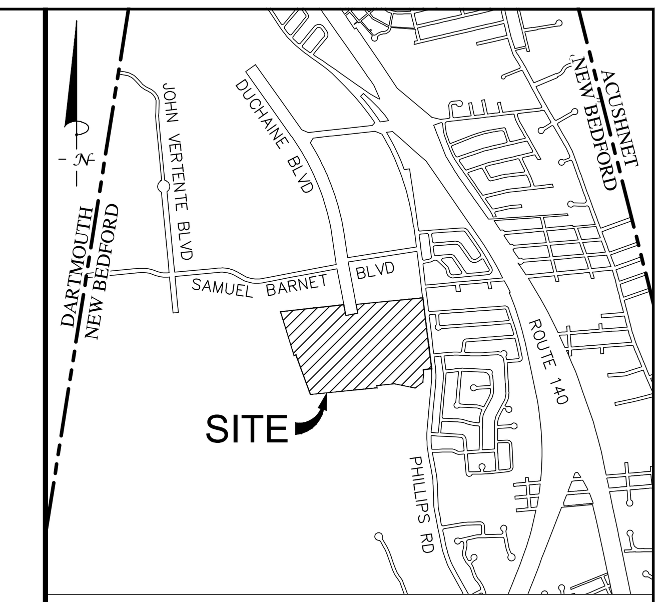

STEP 7

PPNE MOVES 2 FULL CARS FROM BUILDING TO TRACK 4
PPNE MOVES 2 EMPTY CARS FROM TRACK 3

LEGEND

EMPTY RAIL CAR
FULL RAIL CAR
LOCOMOTIVE
RAIL CAR MOVER
PS POINT OF SWITCH

100' 0 100' 200'
BAR SCALE
1" = 100'




LOCUS MAP NOT TO SCALE

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Sagamore Beach, MA 02562
Tel: (508) 888-6034
Fax: (508) 888-1506
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REVISIONS

| NO. | DATE | COMMENT |
|---|---|---|
| | | |

PURPOSE:

SITE ASSIGNMENT

LOCUS:

100 DUCHAINE BOULEVARD
NEW BEDFORD,
MASSACHUSETTS

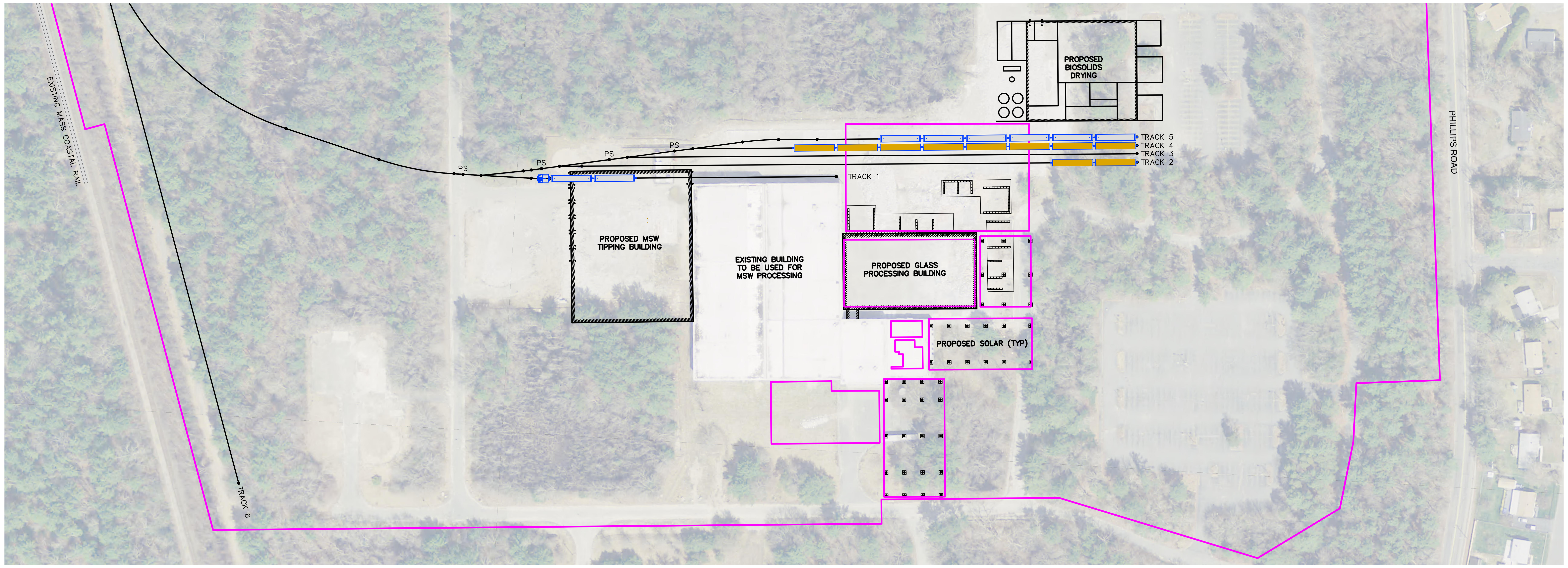
PREPARED FOR:

PARALLEL PRODUCTS, LLC

DRAWING TITLE:

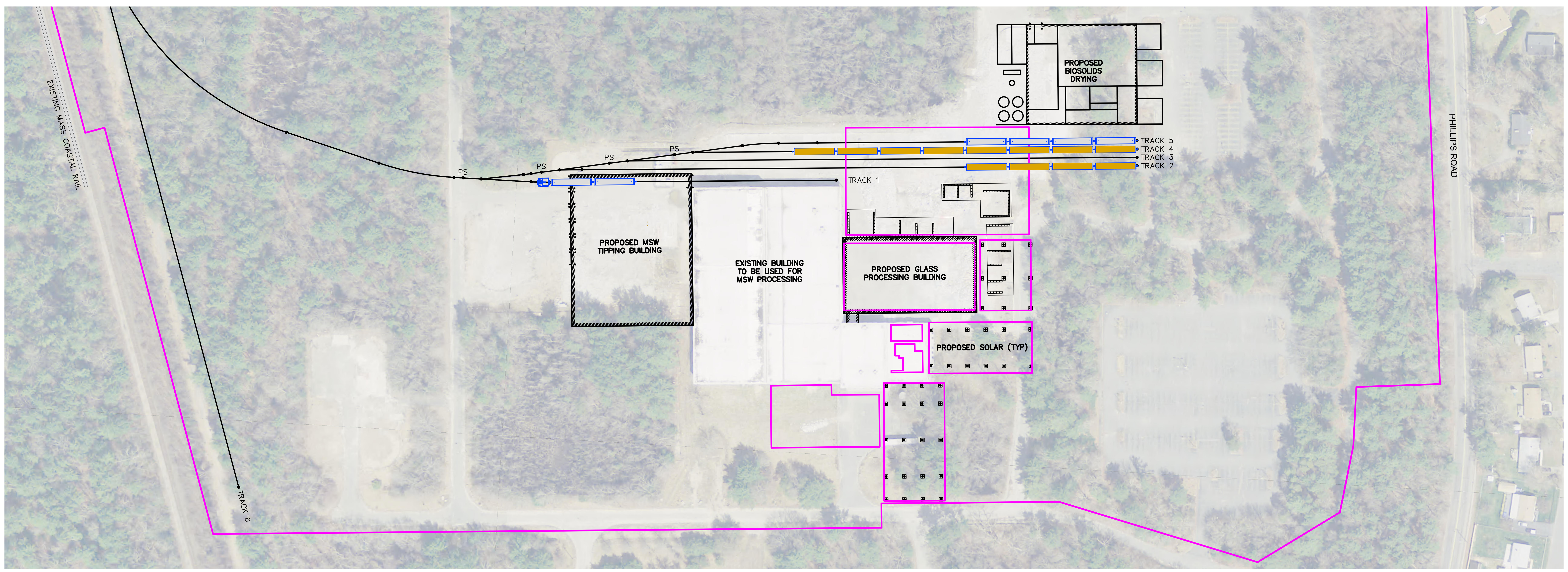
RAIL CAR MOVEMENTS

| CAD TECH: | CHECKED BY: |
|---|---|
| T. JANICKI | |
| ENGINEER: W. HALL | DATE: 5/14/2019 |
| | SCALE: 1"=100' |
| | SHEET: 4 of 7 |




STEP 8

PPNE MOVES 2 FULL CARS FROM BUILDING TO TRACK 2
PPNE MOVES 2 EMPTY CARS FROM TRACK 5 TO BUILDING



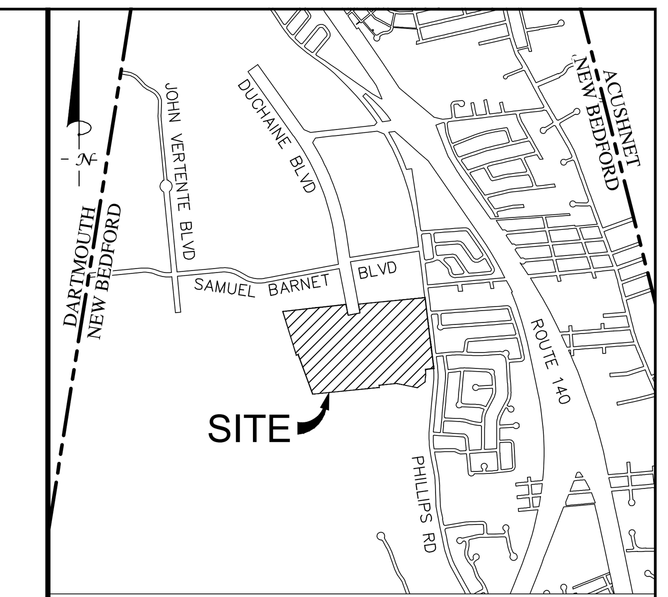

STEP 9

PPNE MOVES 2 FULL CARS FROM BUILDING TO TRACK 2
PPNE MOVES 2 EMPTY CARS FROM TRACK 5 TO BUILDING

LEGEND

- EMPTY RAIL CAR
- FULL RAIL CAR
- LOCOMOTIVE
- RAIL CAR MOVER
- PS POINT OF SWITCH

100' 0 100' 200'
BAR SCALE
1" = 100'




LOCUS MAP NOT TO SCALE

Green Seal Environmental, Inc.
114 State Road, Building B
Sagamore Beach, MA 02562
Tel: (508) 888-6034
Fax: (508) 888-1506
www.gseenv.com



Dimensions are as indicated.

Use of this plan constitutes acceptance of terms and conditions set forth in accompanying project documentation.

It is the responsibility of the user to confirm discrepancies with the Engineer prior to use.

REVISIONS

| NO. | DATE | COMMENT |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

PURPOSE:

SITE ASSIGNMENT

LOCUS:

100 DUCHAINE BOULEVARD
NEW BEDFORD,
MASSACHUSETTS

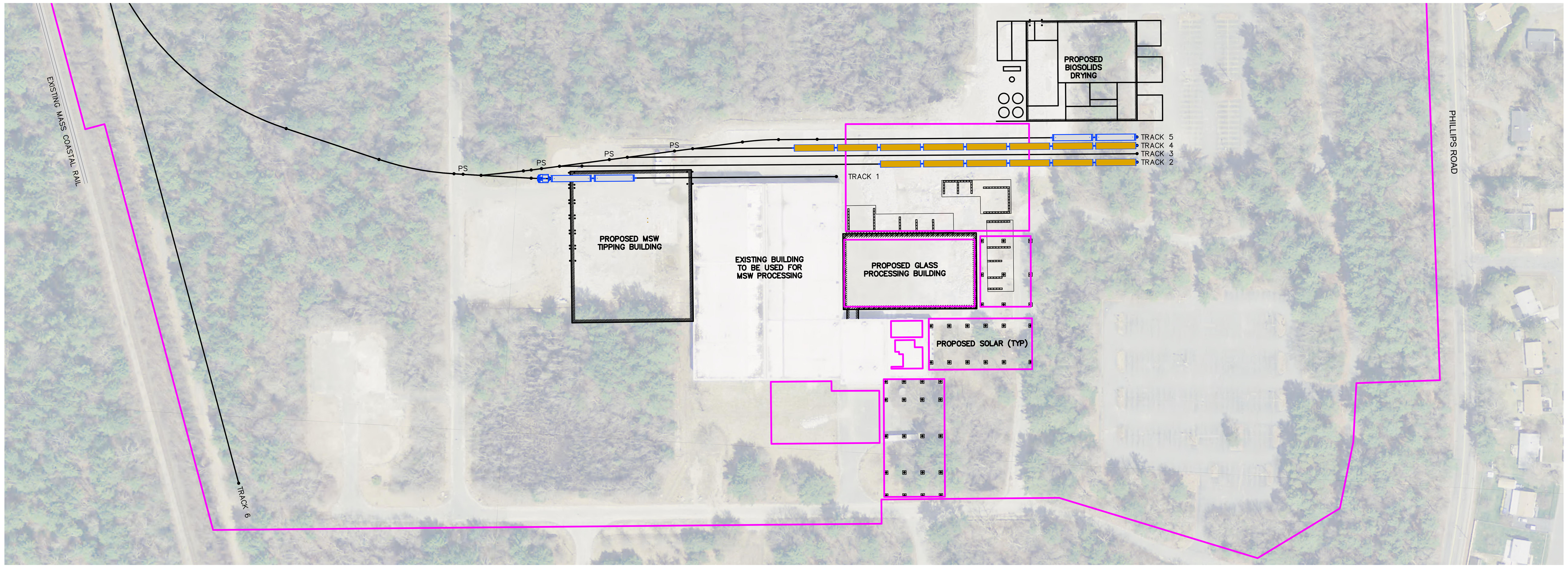
PREPARED FOR:

PARALLEL PRODUCTS, LLC

DRAWING TITLE:

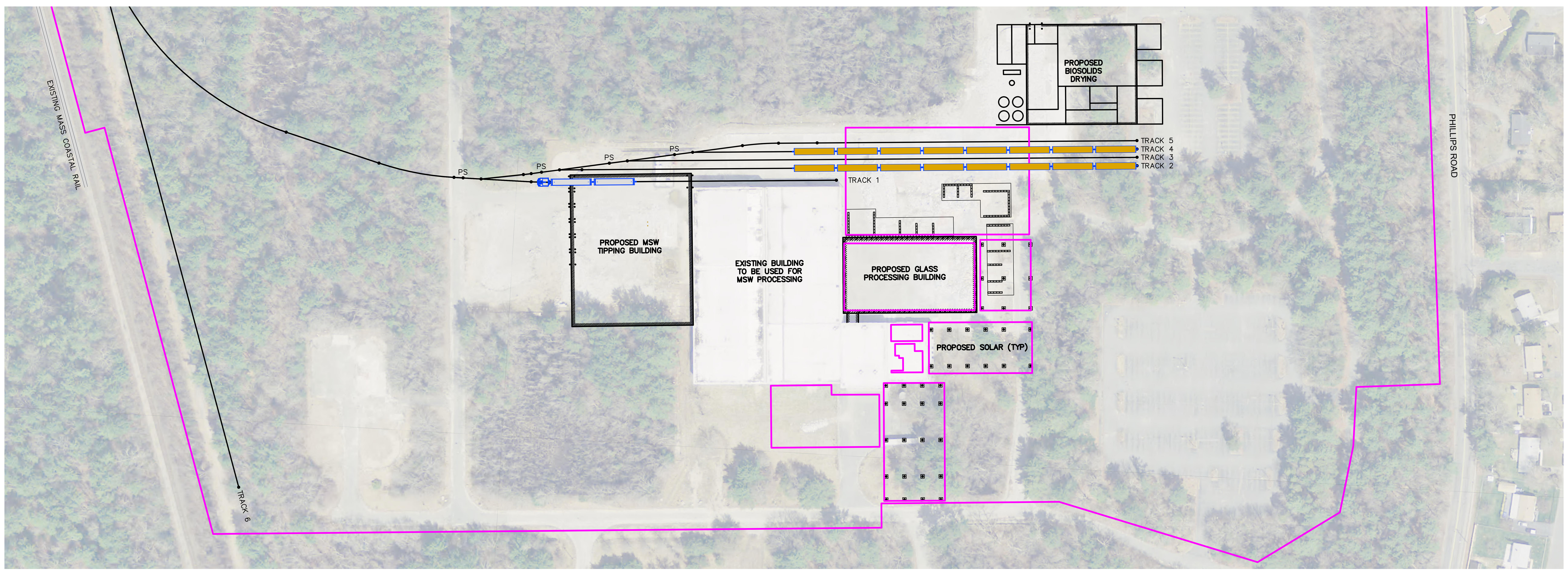
RAIL CAR MOVEMENTS

| CAD TECH: | CHECKED BY: |
|---|---|
| T. JANICKI | |
| ENGINEER: W. HALL | DATE: 5/14/2019 |
| | SCALE: 1"=100' |
| | SHEET: 5 of 7 |




STEP 10

PPNE MOVES 2 FULL CARS FROM BUILDING TO TRACK 2
PPNE MOVES 2 EMPTY CARS FROM TRACK 5 TO BUILDING




STEP 11

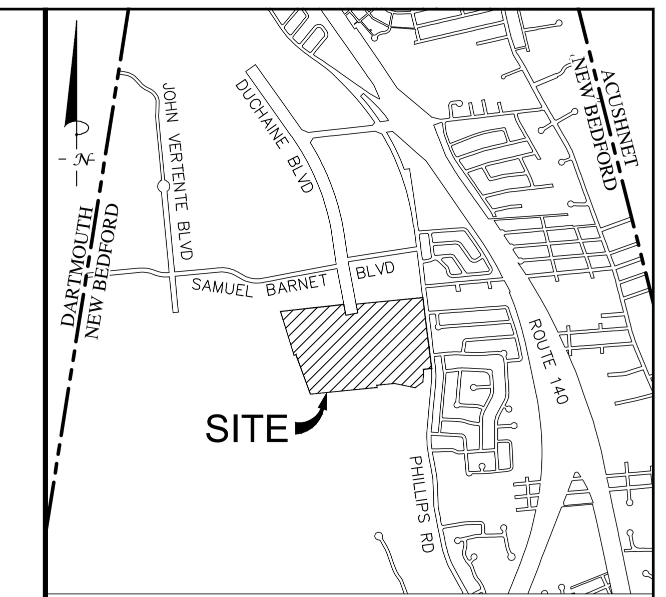
PPNE MOVES 2 FULL CARS FROM BUILDING TO TRACK 2
PPNE MOVES 2 EMPTY CARS FROM TRACK 5 TO BUILDING

LEGEND

- EMPTY RAIL CAR
- FULL RAIL CAR
- LOCOMOTIVE
- RAIL CAR MOVER
- PS POINT OF SWITCH

100' 0 100' 200'

BAR SCALE
1" = 100'




LOCUS MAP NOT TO SCALE


Green Seal Environmental, Inc.
114 State Road, Building B
Sagamore Beach, MA 02562
Tel: (508) 888-6034
Fax: (508) 888-1506
www.gseenv.com




REVISIONS

| NO. | DATE | COMMENT |
|---|---|---|

PURPOSE:

SITE ASSIGNMENT

LOCUS:

100 DUCHAINE BOULEVARD
NEW BEDFORD,
MASSACHUSETTS

PREPARED FOR:

PARALLEL PRODUCTS, LLC

DRAWING TITLE:

RAIL CAR MOVEMENTS

CAD TECH: T. JANICKI

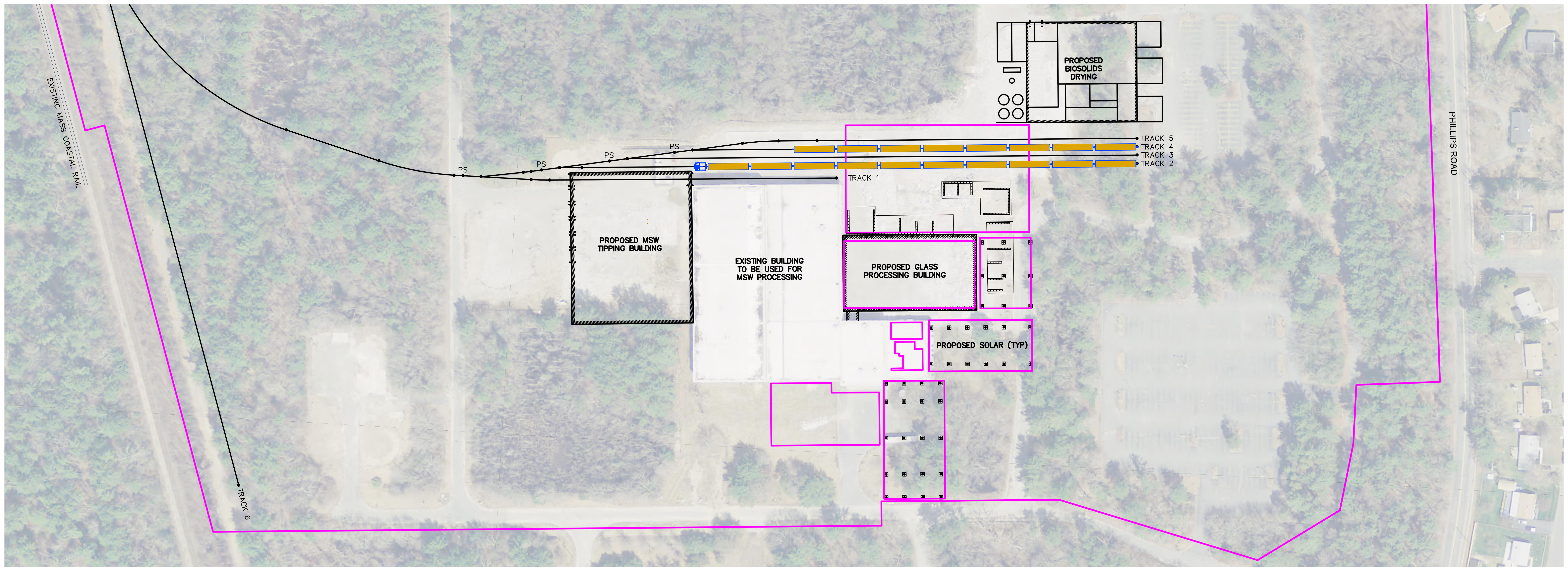
CHECKED BY:

ENGINEER: W. HALL

DATE: 5/14/2019

SCALE: 1"=100'

SHEET: 6 of 7



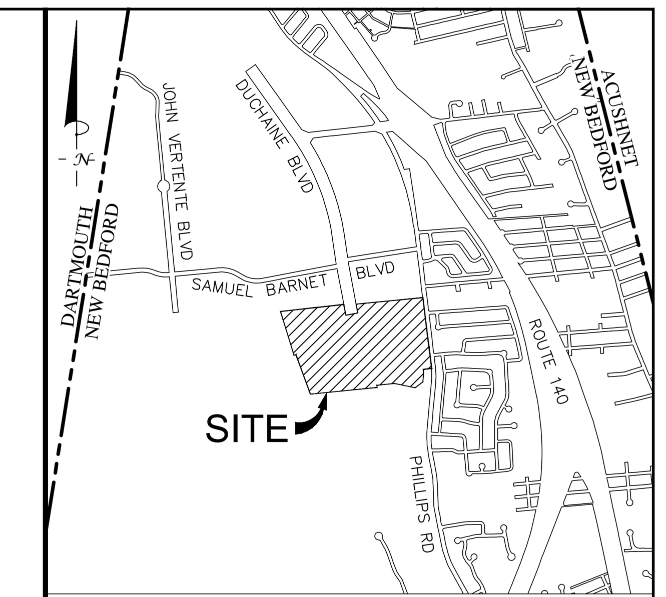

STEP 12

PPNE MOVES 2 FULL CARS FROM BUILDING TO TRACK 2

LEGEND

- EMPTY RAIL CAR
- FULL RAIL CAR
- LOCOMOTIVE
- RAIL CAR MOVER
- PS POINT OF SWITCH

100' 0 100' 200'
BAR SCALE
1" = 100'




LOCUS MAP NOT TO SCALE

Green Seal Environmental, Inc.
114 State Road, Building B
Sagamore Beach, MA 02562
Tel: (508) 888-6034
Fax: (508) 888-1506
www.gseenv.com



Dimensions are as indicated.

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It is the responsibility of the user to confirm discrepancies with the Engineer prior to use.

REVISIONS

| NO. | DATE | COMMENT |
|---|---|---|
| | | |

PURPOSE:

SITE ASSIGNMENT

LOCUS:

100 DUCHAINE BOULEVARD
NEW BEDFORD,
MASSACHUSETTS

PREPARED FOR:

PARALLEL PRODUCTS, LLC

DRAWING TITLE:

RAIL CAR MOVEMENTS

CAD TECH: T. JANICKI

CHECKED BY:

ENGINEER: W. HALL

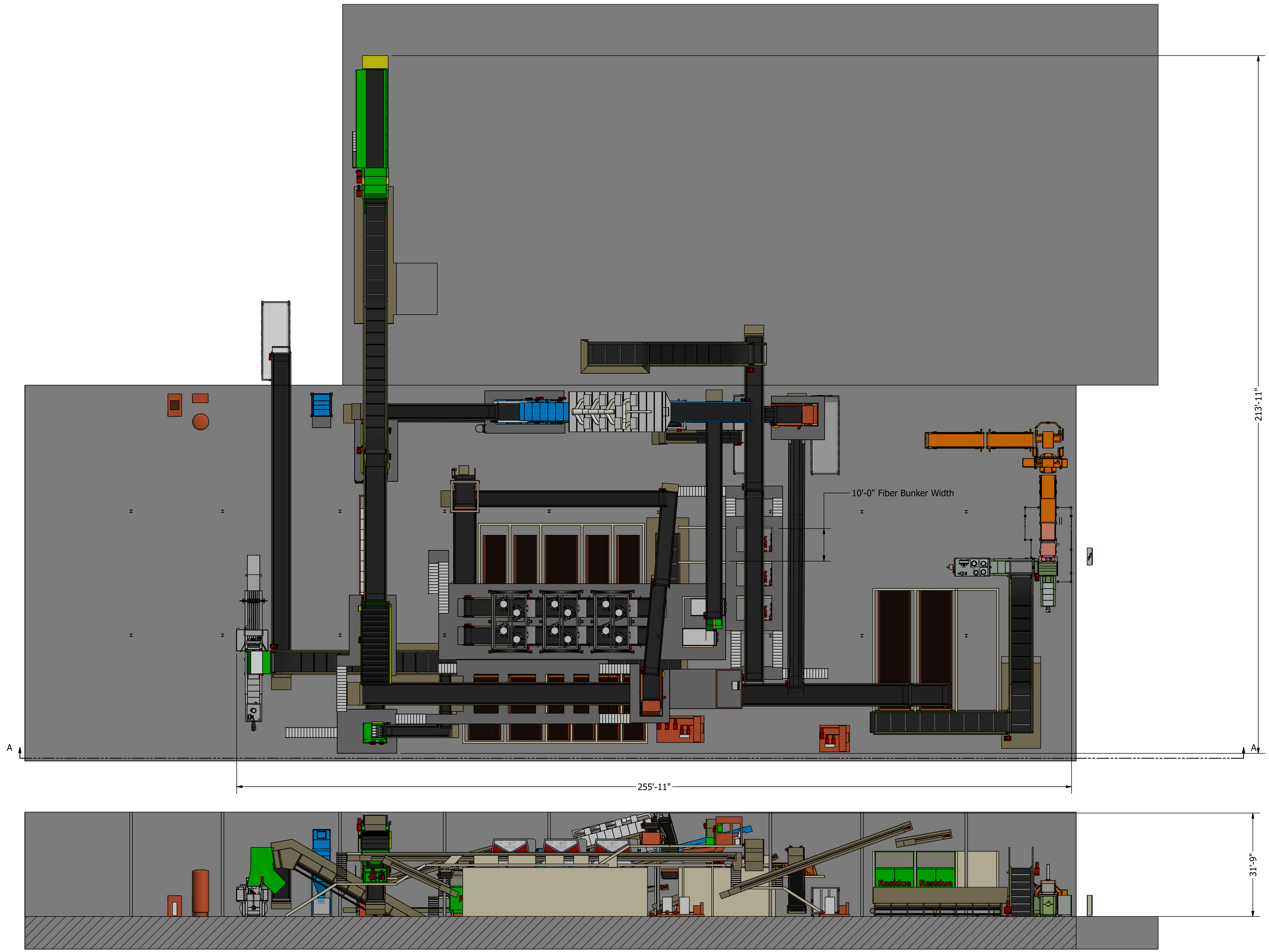
DATE: 5/14/2019

SCALE: 1"=100'

SHEET: 7 of 7

ATTACHMENT10

MSW PROCESSING LINE




SECTION A-A

**Item# Legend:**

- Bxxx - By Customer
- BRxxx - Retrofit By Customer
- Cxxx - Conveyor
- Exxx - Equipment
- Sxxx - Structure
- Rxxx - Retrofit By BHS



3592 West 5th Avenue
Eugene, OR 97402

Phone: (541) 485-0999
Fax: (541) 485-6341

| | |
|---|---|
| Client: Parallel Products | Date: 6/6/2018 |
| Loc.: New Bedford, MA | File: 17-0289-20C1D |
| Title: MSW Processing Facility | Proposal# 17-0289 |
| **Sales Drawing - For Reference Only** | DWG# 20C1D; Sheet 1 of 4; REV C |

What's next.

## Equipment List

| Item# | Description |
|---|---|
| C001 | Infeed Chainbelt |
| C002 | 12in DRS Infeed |
| C003 | Bulky Sort Conveyor |
| C004 | Bag Collection Conveyor |
| C005 | Bag Breaker Infeed Conveyor |
| C006 | Fines DRS Infeed |
| C007 | DRS Fines Conveyor |
| C008 | SDS Infeed |
| C009 | Heavies Magnet Infeed Conveyor |
| C010 | Mid Conveyor |
| C011 | Heavies ECS Infeed |
| C012 | Ferrous Transfer Conveyor |
| C013 | Splitter Feed Conveyor |
| C014 | Aqc Sort Conveyor 2 |
| C015 | Aqc Sort Conveyor 1 |
| C016 | Mid Fraction Magnet Infeed |
| C017 | Mid Transfer Conveyor |
| C018 | Mid Transfer Conveyor 2 |
| C019 | Mid ECS Infeed |
| C020 | Lights Transfer Conveyor |
| C021 | Light Sort Conveyor |
| C022 | Residue Outfeed Conveyor |
| C023 | Residue Leveling Conveyor |
| C024 | Residue Reversing Conveyor |
| C026 | Residue Collection Chainbelt |
| C027 | Residue Baler Infeed |
| C028 | Light Commodity Transfer Chainbelt |
| C029 | Commodity Collection Chainbelt |
| C030 | Commodity Baler Infeed |
| C031 | Baler Bypass Conveyor |
| C032 | Residue Feed Chainbelt |
| C033 | Mid Ferrous Transfer Conveyor |
| E001 | Metering Bin |
| E002 | 12in BHS Debris Roll Screen® |
| E003 | Bag Breaker |
| E004 | Fines BHS Debris Roll Screen® |
| E005 | Nihot Double Drum Separator |
| E006 | Fines Magnet |
| E007 | P2 Fines Eddy Current Separator |
| E008 | Mid Splitter Chute |
| E009 | Vibe Pan 1 |
| E010 | Vibe Pan 2 |
| E011 | Max-AI™ Autonomous QC 1 |
| E012 | Max-AI™ Autonomous QC 2 |
| E013 | Max-AI™ Autonomous QC 3 |
| E014 | Overband Magnet |

## Equipment List

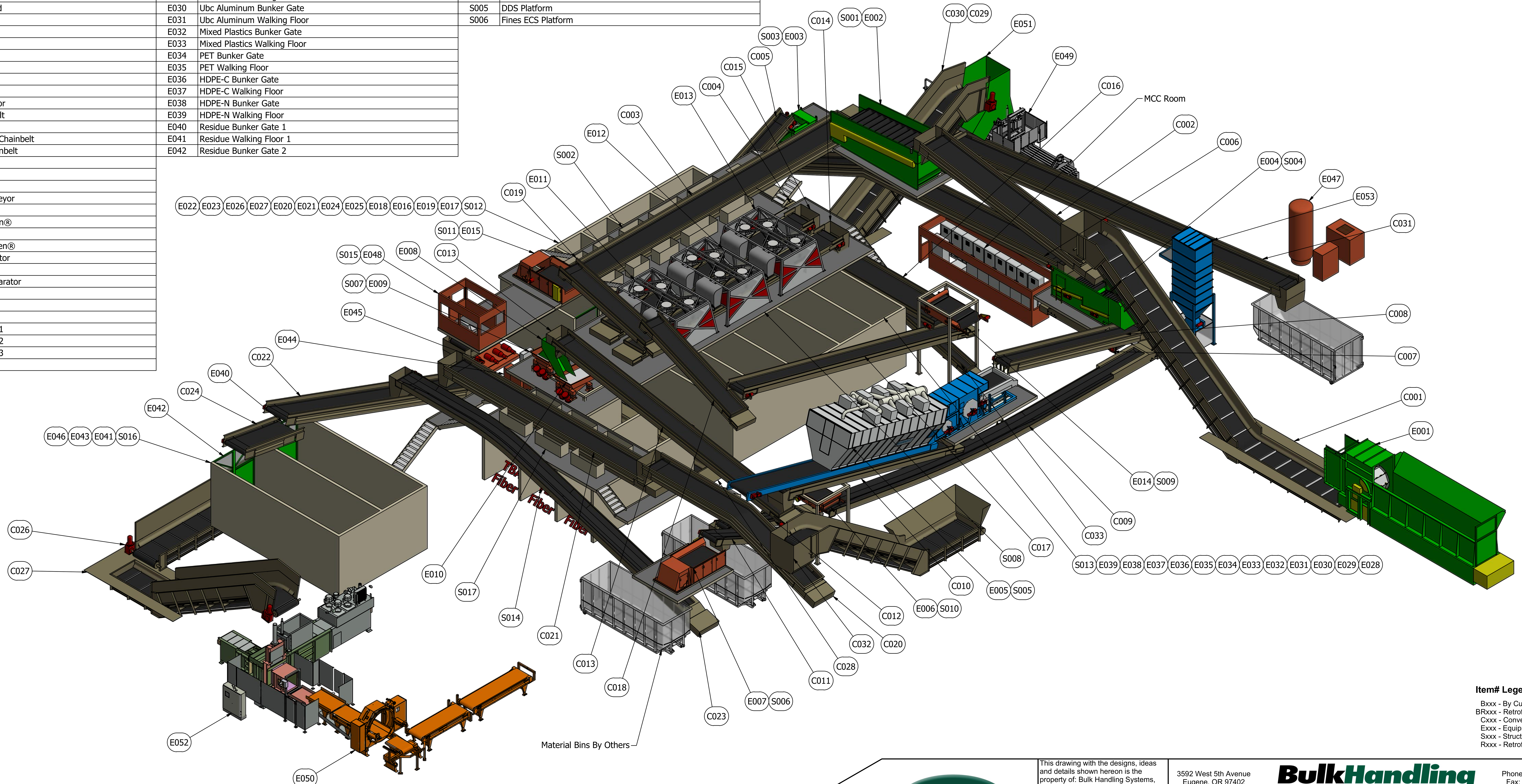
| Item# | Description |
|---|---|
| E015 | Mid Eddy Current Separator |
| E016 | OCC Bunker Gate 1 |
| E017 | OCC Walking Floor 1 |
| E018 | OCC Bunker Gate 2 |
| E019 | OCC Walking Floor 2 |
| E020 | Bulky Wood Bunker Gate |
| E021 | Bulky Wood Walking Floor |
| E022 | Bulky Plastics Bunker Gate |
| E023 | Bulky Plastics Walking Floor |
| E024 | Bulky Metals Bunker Gate |
| E025 | Bulky Metals Walking Floor |
| E026 | Mixed Aluminum Bunker Gate |
| E027 | Mixed Aluminum Walking Floor |
| E028 | Mid Ferrous Bunker Gate |
| E029 | Mid Ferrous Walking Floor |
| E030 | Ubc Aluminum Bunker Gate |
| E031 | Ubc Aluminum Walking Floor |
| E032 | Mixed Plastics Bunker Gate |
| E033 | Mixed Plastics Walking Floor |
| E034 | PET Bunker Gate |
| E035 | PET Walking Floor |
| E036 | HDPE-C Bunker Gate |
| E037 | HDPE-C Walking Floor |
| E038 | HDPE-N Bunker Gate |
| E039 | HDPE-N Walking Floor |
| E040 | Residue Bunker Gate 1 |
| E041 | Residue Walking Floor 1 |
| E042 | Residue Bunker Gate 2 |

## Equipment List

| Item# | Description |
|---|---|
| E043 | Residue Walking Floor 2 |
| E044 | Commodity Walking Floor HPU 2 |
| E045 | Commodity Walking Floor HPU |
| E046 | Residue Walking Floor HPU |
| E047 | Air Compressor |
| E048 | Control Room |
| E049 | Commodity Baler |
| E050 | Residue Bale Wrap Machine |
| E051 | Baler Diverter Gate |
| E052 | 2 Ram Residue Baler |
| E053 | Nihot Dust Collector |
| S001 | Scalping Screen Platform |
| S002 | Bulky Sort Platform |
| S003 | Bag Breaker Platform |
| S004 | Fines DRS Platform |
| S005 | DDS Platform |
| S006 | Fines ECS Platform |

## Equipment List

| Item# | Description |
|---|---|
| S007 | Vibe Screen Structure |
| S008 | Aqc Platform |
| S009 | Mid Magnet Structure |
| S010 | Fines Magnet Structure |
| S011 | Mid ECS Platform |
| S012 | Bulky Material Bunker Walls |
| S013 | Container Bunker Walls |
| S014 | Fiber Bunker Walls |
| S015 | Control Room Platform |
| S016 | Residue Bunker Walls |
| S017 | Fiber Sort Platform |




**Item# Legend:**

Bxxx - By Customer
BRxxx - Retrofit By Customer
Cxxx - Conveyor
Exxx - Equipment
Sxxx - Structure
Rxxx - Retrofit By BHS




3592 West 5th Avenue
Eugene, OR 97402

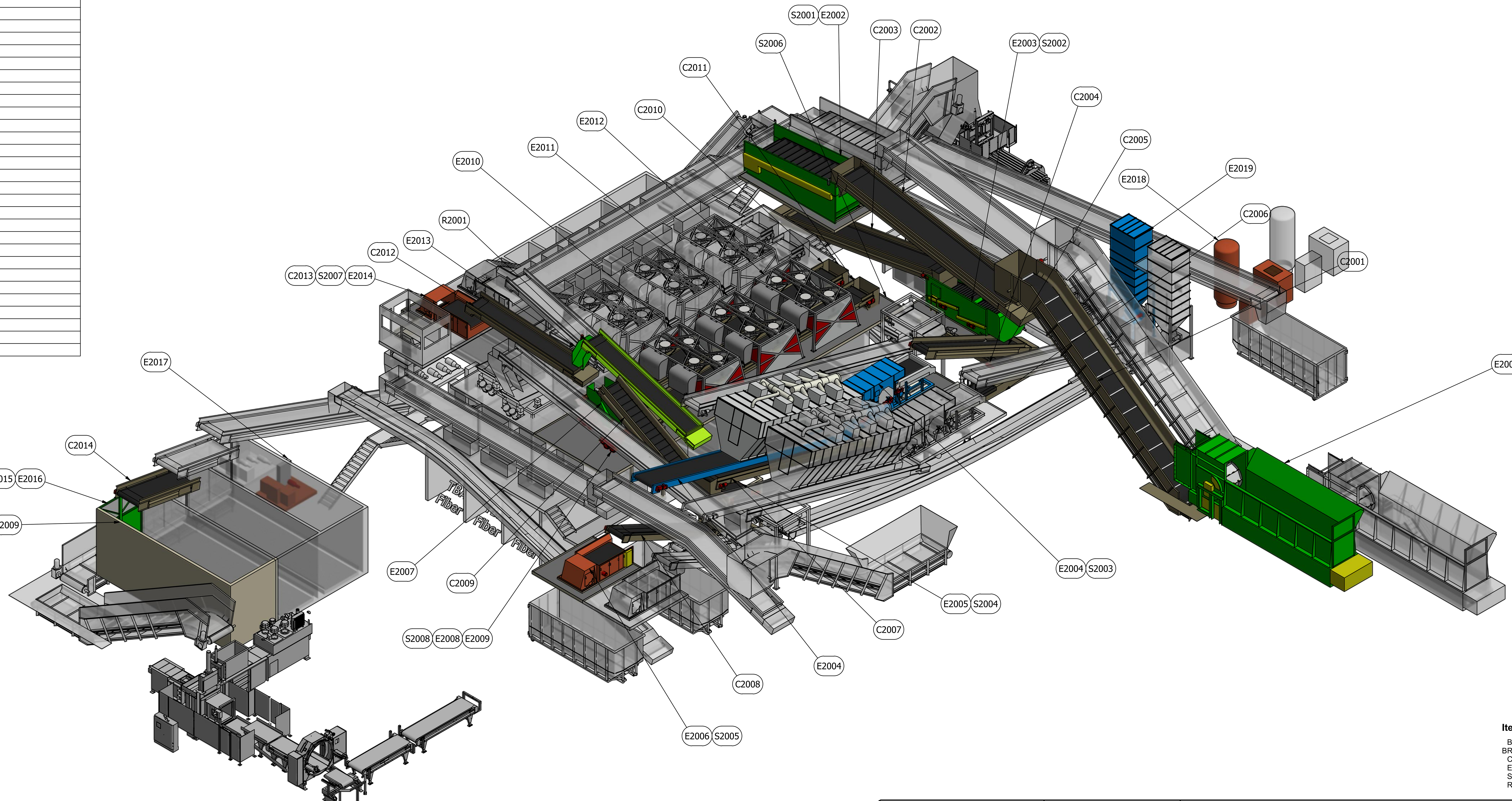
Bulk Handling Systems

Phone: (541) 485-0999
Fax: (541) 485-6341


| | |
|---|---|
| Client: Parallel Products | Date: 6/6/2018 |
| Loc.: New Bedford, MA | File: 17-0289-20C1D |
| Title: MSW Processing Facility<br>Phase 1 | Proposal# 17-0289 |
| **Sales Drawing - For Reference Only** | DWG# 20C1D REV C<br>Sheet 2 of 4 |

## Equipment List

| Item# | Description |
|---|---|
| C2001 | P2 Infeed Chainbelt |
| C2002 | P2 12in DRS Infeed |
| C2003 | P2 Fines DRS Infeed |
| C2004 | P2 DRS Fines Conveyor |
| C2005 | P2 SDS Infeed |
| C2006 | P2 Heavies Magnet Infeed Conveyor |
| C2007 | SDS Mid Conveyor |
| C2008 | P2 Heavies ECS Infeed |
| C2009 | P2 Splitter Infeed Conveyor |
| C2010 | P2 Aqc Sort Conveyor 1 |
| C2011 | P2 Aqc Sort Conveyor 2 |
| C2012 | P2 Mid ECS Infeed |
| C2013 | Non-fe Transfer Conveyor |
| C2014 | P2 Residue Reversing Conveyor |
| E2001 | P2 Metering Bin |
| E2002 | P2 12in BHS Debris Roll Screen® |
| E2003 | P2 Fines BHS Debris Roll Screen® |
| E2004 | P2 Nihot Double Drum Separator |
| E2005 | P2 Fines Magnet |
| E2006 | Fines Eddy Current Separator |
| E2007 | P2 Mid Aqc Splitter Chute |
| E2008 | P2 Vibe Pan 1 |
| E2009 | P2 Vibe Pan 2 |
| E2010 | P2 Max-AI™ Autonomous QC 1 |
| E2011 | P2 Max-AI™ Autonomous QC 2 |
| E2012 | P2 Max-AI™ Autonomous QC 3 |
| E2013 | P2 Mid ECS Splitter Chute |
| E2014 | P2 Mid Eddy Current Separator |
| E2015 | P2 Residue Walking Floor |
| E2016 | P2 Residue Bunker Gate |
| E2017 | P2 Residue Walking Floor HPU |
| E2018 | P2 Air Compressor |
| E2019 | P2 Nihot Dust Collector |
| R2001 | Mid Transfer Conveyor 2 - Modified |
| S2001 | P2 Scalping Screen Platform |
| S2002 | P2 Fines DRS Platform |
| S2003 | P2 DDS Platform |
| S2004 | P2 Fines Magnet Structure |
| S2005 | P2 Fines ECS Platform |
| S2006 | P2 Aqc Platform Addition |
| S2007 | P2 Mid ECS Platform |
| S2008 | P2 Vibe Screen Structure |
| S2009 | P2 Residue Bunker Walls |




**Item# Legend:**

Bxxx - By Customer
BRxxx - Retrofit By Customer
Cxxx - Conveyor
Exxx - Equipment
Sxxx - Structure
Rxxx - Retrofit By BHS

MAX-AI™ ZeroWaste™ NRT NIHOT® BHS What's next.

Max-AI™, BHS Bag Breaker®, BHS De-Inking Screen®,BHS Debris Roll Screen®, BHS Metering Bin, BHS NewSorter®, Glass Breaker DRS®, BHS Polishing Screen, BHS FiberPure™, AIRCONOMY®, NRT MultiSort® IR, NRT SpydIR®-R, NRT SpydIR®-T, NRT ColorPlus™, NRT FlakeSort™-C, NRT MetalDirector™, NRT MetalDirector™ Flake, NRT OnlineAnalyzer™, NRT TruSort® with DXRT™, NRT TruSort® with XRF™, In-Flight Sorting®, PET Boost®, SMARTFERM®



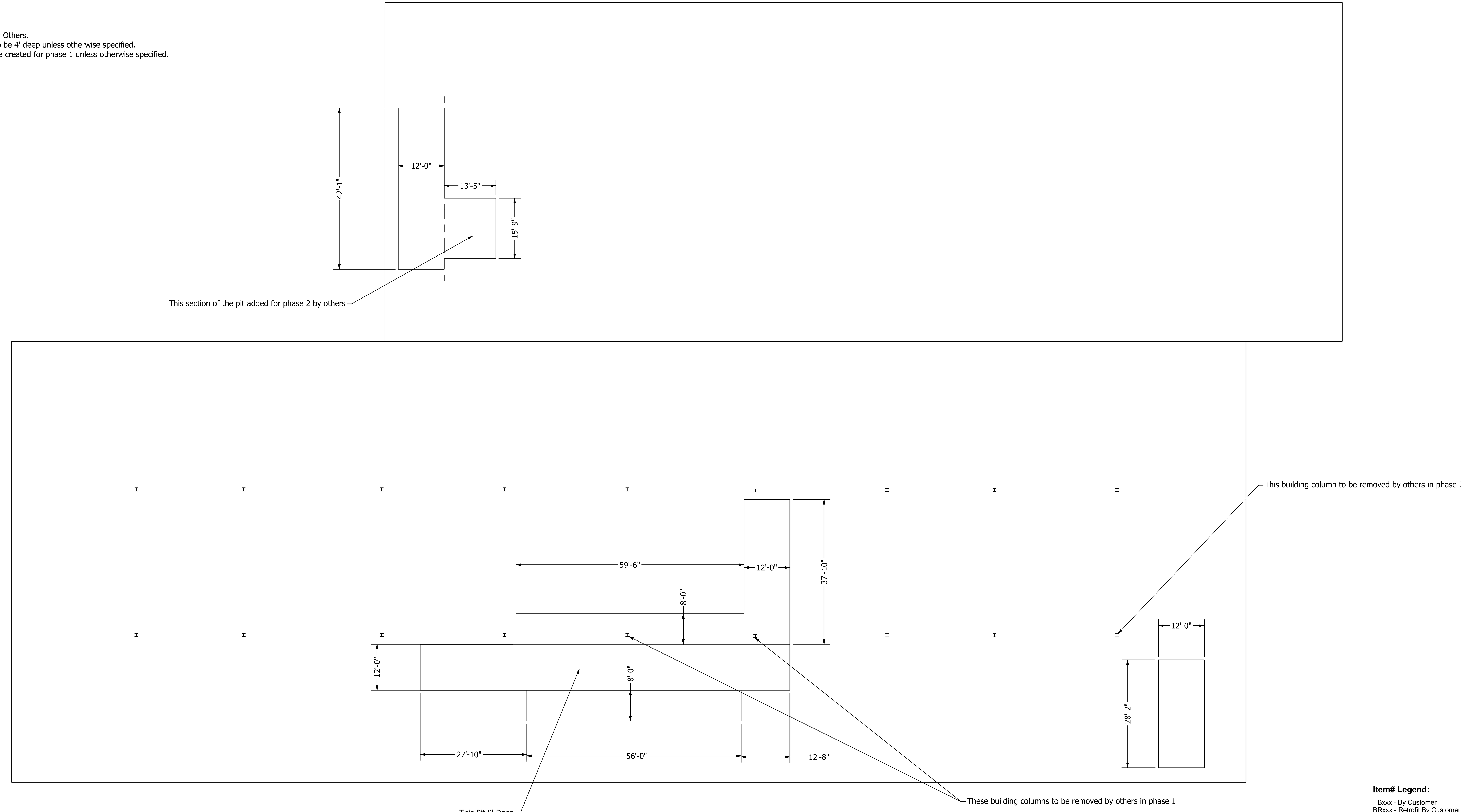
3592 West 5th Avenue
Eugene, OR 97402

BulkHandling SYSTEMS

Phone: (541) 485-0999
Fax: (541) 485-6341

| | |
|---|---|
| Client: Parallel Products | Date: 6/6/2018 |
| Loc.: New Bedford, MA | File: 17-0289-20C1D |
| Title: MSW Processing Facility<br>Phase 2 | Proposal# 17-0289 |
| **Sales Drawing - For Reference Only** | DWG# 20C1D<br>Sheet 3 of 4<br>REV C |

Civil Work By Others.
All pits are to be 4' deep unless otherwise specified.
All pits will be created for phase 1 unless otherwise specified.




**Item# Legend:**

- Bxxx - By Customer
- BRxxx - Retrofit By Customer
- Cxxx - Conveyor
- Exxx - Equipment
- Sxxx - Structure
- Rxxx - Retrofit By BHS

What's next.



3592 West 5th Avenue
Eugene, OR 97402

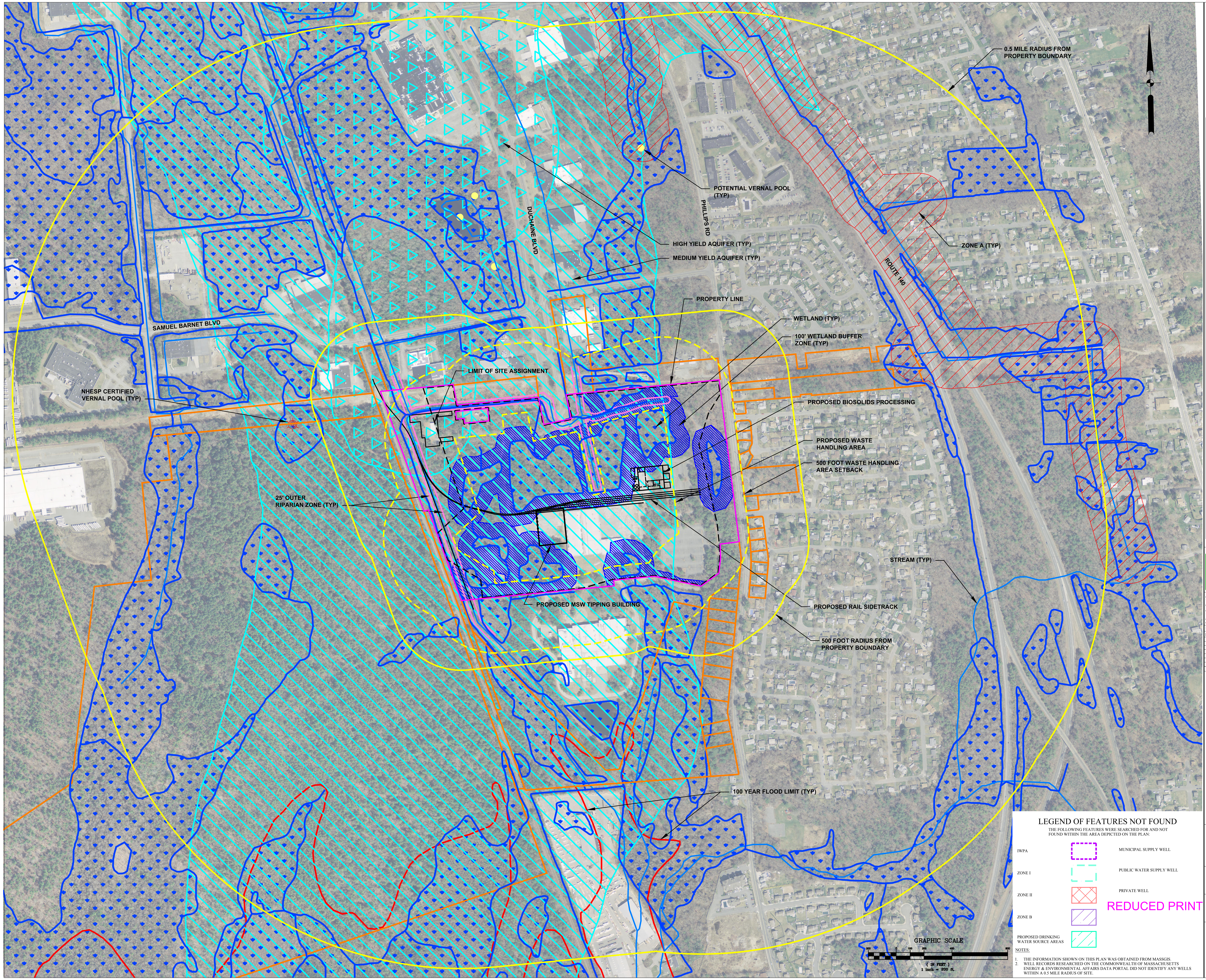
Bulk Handling SYSTEMS

Phone: (541) 485-0999
Fax: (541) 485-6341

| | |
|---|---|
| Client: Parallel Products | Date: 6/6/2018 |
| Loc.: New Bedford, MA | File: 17-0289-20C1D |
| Title: MSW Processing Facility<br>Necessary Civil Work | Proposal# 17-0289 |
| Sales Drawing - For Reference Only | DWG# 20C1D · Sheet 4 of 4 · REV C |

# ATTACHMENT 11

# WATER RESOURCES PLAN




## LEGEND

- DEP WETLANDS
- 100' BUFFER ZONE
- HIGH YIELD AQUIFER
- MEDIUM YIELD AQUIFER
- ZONE A
- 500 FOOT AND 0.5 MILE SITE SETBACKS
- WASTE HANDLING AREA AND 500 FOOT SETBACK
- SITE ASSIGNMENT LINE
- SITE PROPERTY LINES
- ABUTTER PROPERTY LINE
- FEMA 100 YEAR FLOOD LIMIT
- 25' OUTER RIPARIAN ZONE TO RIVERFRONT AREA
- NHESP CERTIFIED VERNAL POOL
- POTENTIAL VERNAL POOL

## LEGEND OF FEATURES NOT FOUND

THE FOLLOWING FEATURES WERE SEARCHED FOR AND NOT FOUND WITHIN THE AREA DEPICTED ON THE PLAN:

- IWPA
- ZONE I
- ZONE II
- ZONE B
- PROPOSED DRINKING WATER SOURCE AREAS
- MUNICIPAL SUPPLY WELL
- PUBLIC WATER SUPPLY WELL
- PRIVATE WELL

REDUCED PRINT

NOTES:

1. THE INFORMATION SHOWN ON THIS PLAN WAS OBTAINED FROM MASSGIS.
2. WELL RECORDS RESEARCHED ON THE COMMONWEALTH OF MASSACHUSETTS ENERGY & ENVIRONMENTAL AFFAIRS DATA PORTAL DID NOT IDENTIFY ANY WELLS WITHIN A 0.5 MILE RADIUS OF SITE.

Green Seal Environmental, Inc.
114 State Road, Building B
Sagamore Beach, MA 02562
Tel: (508) 888-6034
Fax: (508) 888-1506
www.gseenv.com



Dimensions are as indicated.

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It is the responsibility of the user to confirm discrepancies with the Engineer prior to use.

REVISIONS

| NO. | DATE | COMMENT |
|---|---|---|
| A | 2/1/2019 | ISSUED FOR PERMITTING |
| B | 5/14/2019 | INCORPORATED MASSDEP COMMENTS |

PURPOSE:

SITE SUITABILITY

LOCUS:

**NEW BEDFORD INDUSTRIAL PARK**
100 DUCHAINE BOULEVARD
NEW BEDFORD, MA 02745

PREPARED FOR:

**PARALLEL PRODUCTS OF NEW ENGLAND, INC.**
969 SHAWMUT AVENUE
NEW BEDFORD, MA 02746

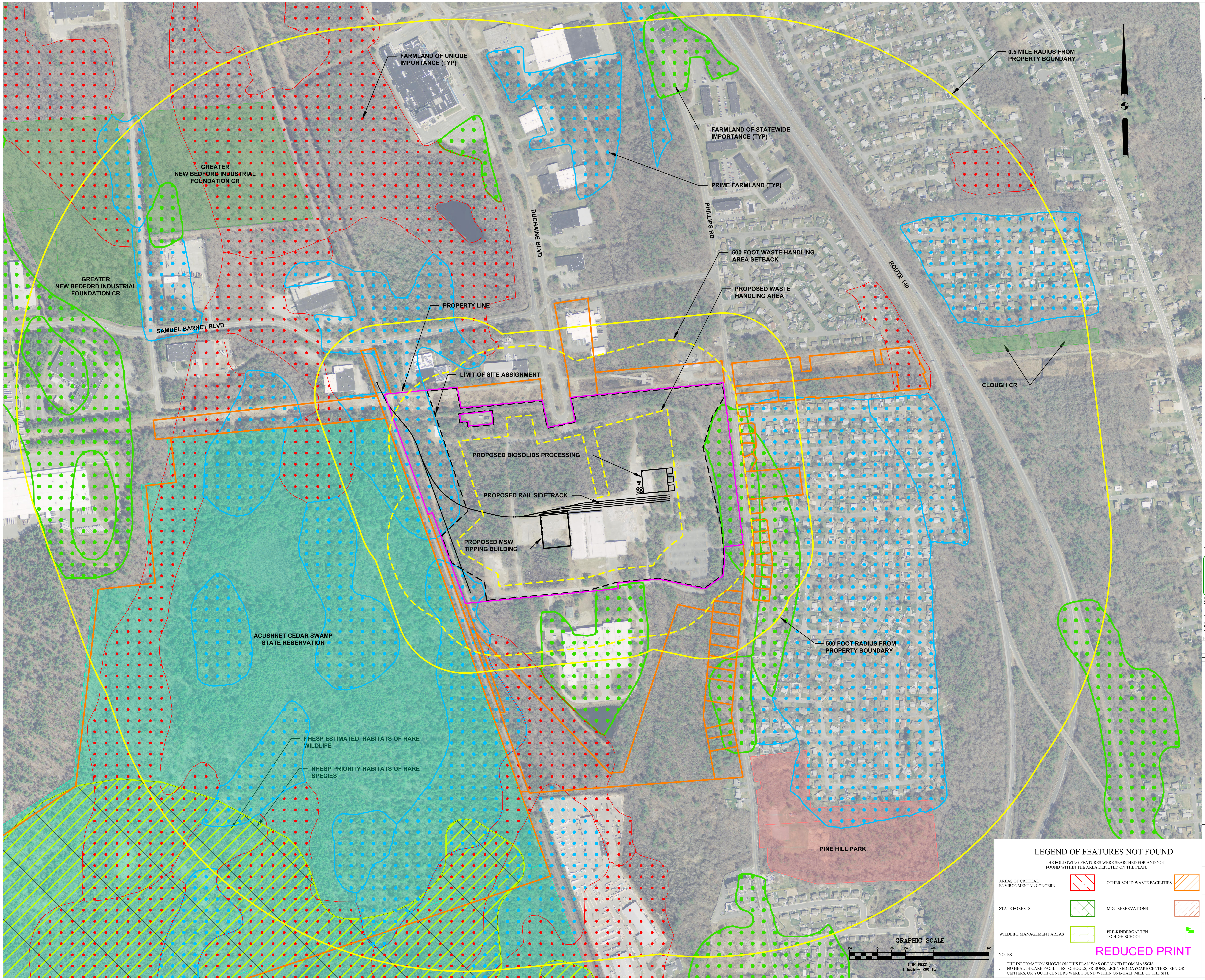
DRAWING TITLE:

WATER RESOURCES PLAN

| CAD TECH: | CHECKED BY: |
|---|---|
| T. JANICKI | G. WIRSEN |
| ENGINEER: W. HALL | DATE: 2/1/2019 |
| | SCALE: 1" = 200' |
| | SHEET: FIGURE 5 |

ATTACHMENT 12

# LAND USE PLAN




LEGEND

- PRIME FARMLAND
- FARMLAND OF UNIQUE IMPORTANCE
- FARMLAND OF STATEWIDE IMPORTANCE
- CONSERVATION AREA
- RECREATION AREA
- CONSERVATION AND RECREATION AREA
- NHESP PRIORITY HABITATS OF RARE SPECIES
- NHESP ESTIMATED HABITATS OF RARE WILDLIFE
- 500 FOOT AND 0.5 MILE SITE SETBACKS
- WASTE HANDLING AREA AND 500 FOOT SETBACK
- SITE ASSIGNMENT LINE
- SITE PROPERTY LINES
- ABUTTER PROPERTY LINE

LEGEND OF FEATURES NOT FOUND

THE FOLLOWING FEATURES WERE SEARCHED FOR AND NOT FOUND WITHIN THE AREA DEPICTED ON THE PLAN:

- AREAS OF CRITICAL ENVIRONMENTAL CONCERN
- OTHER SOLID WASTE FACILITIES
- STATE FORESTS
- MDC RESERVATIONS
- WILDLIFE MANAGEMENT AREAS
- PRE-KINDERGARTEN TO HIGH SCHOOL

REDUCED PRINT

NOTES:

1. THE INFORMATION SHOWN ON THIS PLAN WAS OBTAINED FROM MASSGIS.
2. NO HEALTH CARE FACILITIES, SCHOOLS, PRISONS, LICENSED DAYCARE CENTERS, SENIOR CENTERS, OR YOUTH CENTERS WERE FOUND WITHIN ONE-HALF MILE OF THE SITE.


Green Seal Environmental, Inc.
114 State Road, Building B
Sagamore Beach, MA 02562
Tel: (508) 888-6034
Fax: (508) 888-1506
www.gseenv.com




Dimensions are as indicated.

Use of this plan constitutes acceptance of terms and conditions set forth in accompanying project documentation.

It is the responsibility of the user to confirm discrepancies with the Engineer prior to use.

REVISIONS

| NO. | DATE | COMMENT |
|---|---|---|
| A | 2/1/2019 | ISSUED FOR PERMITTING |
| B | 5/14/2019 | INCORPORATED MASSDEP COMMENTS |

PURPOSE:

SITE SUITABILITY

LOCUS:

**NEW BEDFORD INDUSTRIAL PARK**
100 DUCHAINE BOULEVARD
NEW BEDFORD, MA 02745

PREPARED FOR:

**PARALLEL PRODUCTS OF NEW ENGLAND, INC.**
969 SHAWMUT AVENUE
NEW BEDFORD, MA 02746

DRAWING TITLE:

LAND USE PLAN

| CAD TECH: | CHECKED BY: |
|---|---|
| T. JANICKI | G. WIRSEN |
| ENGINEER: | DATE: |
| W. HALL | 2/1/2019 |

COMMONWEALTH OF MASSACHUSETTS
WHITNEY W. HALL II
CIVIL
NO. 29740
REGISTERED PROFESSIONAL ENGINEER

SCALE: 1" = 200'

SHEET: FIGURE 6

# ATTACHMENT 13

# NOISE IMPACTS

# SOUND LEVEL ASSESSMENT REPORT

## Parallel Products of New England
## New Bedford, Massachusetts

*Prepared for:*

***Parallel Products of New England***
100 Duchaine Boulevard
New Bedford, MA 02740

*Prepared by:*

***Epsilon Associates, Inc.***
3 Mill & Main Place, Suite 250
Maynard, MA  01754

August 27, 2019

# TABLE OF CONTENTS



# LIST OF APPENDICES

## LIST OF FIGURES



## LIST OF TABLES

# 1.0 EXECUTIVE SUMMARY

Parallel Products of New England, Inc. (PPNE) is currently constructing a glass handling and processing facility at 100 Duchaine Boulevard in New Bedford, Massachusetts. PPNE is proposing to construct a municipal solid waste processing and transfer facility and biosolids processing facility at this site. Epsilon Associates, Inc. (Epsilon) has been retained by PPNE to conduct a sound level assessment for this Project. Existing condition sound levels were measured around the site, an operational sound level modeling analysis was conducted for the major sound producing elements of the Project, and noise controls necessary to meet the requirements of the Massachusetts Department of Environmental Protection (MassDEP) Noise Policy were implemented and are discussed in this analysis. In addition, at the request of the MassDEP Southeast Regional Office Solid Waste Division, a traffic noise modeling analysis was conducted to evaluate noise levels from truck deliveries to the Project site.

Existing condition sound levels were measured for seven days at two locations on the site. Two supplemental short-term measurements were also performed at additional locations near the site. The 7-day average sound level using the lowest hourly $L_{90}$ sound level measured during each daytime and nighttime period of the program was used to establish a daytime and nighttime background at each location.

Operations at the proposed facility will vary slightly between daytime and nighttime periods. Sound level modeling was conservatively conducted for a daytime scenario and compared to both daytime and nighttime ambient sound levels. Mitigation was applied to several of the sound sources including use of an electric rail car mover, fan silencers, a stack silencer, and a noise barrier wall. With the noise mitigation measures described in this report, or equivalent design changes, the proposed Project will meet the requirements set forth in the MassDEP Noise Policy at residential locations.

The number of truck deliveries to the site will vary throughout the daytime and nighttime periods. Traffic noise modeling of on-site trucking activity was conservatively conducted for the peak hour and resulting sound levels were compared to the Federal Highway Administration (FHWA) residential noise abatement criterion of 66 dBA (absolute level) and to the Massachusetts Department of Transportation's (MassDOT) significance threshold of 10 dBA or greater increase over existing sound levels. Results of the traffic noise modeling analysis indicate the proposed Project will be below these thresholds set forth by the FHWA and MassDOT.

# 2.0 INTRODUCTION

Parallel Products of New England, Inc. (PPNE) is currently constructing a glass handling and processing facility at 100 Duchaine Boulevard in New Bedford, Massachusetts. PPNE is proposing to construct a municipal solid waste processing and transfer facility and biosolids processing facility at this site. The project will be implemented in sequential phases. The glass handling is being implemented as Phase 1. The MSW processing will be implemented as Phase 2 and the biosolids processing will be implemented as Phase 3. This sound level evaluation is cumulative for all three phases of operations.

The glass handling operation will recycle the used glass containers that are collected through the Massachusetts deposit system. Bottles collected will be processed such that the glass can be reused to produce new glass containers. Processing at the site will include crushing, sizing and separation of the glass by color. The cullet produced is then sold to glass manufacturers. To facilitate the shipment of recycled glass by rail, the Proponent will construct a rail sidetrack from the existing rail line adjacent to the project site. Glass handling operations are enclosed by three adjacent buildings.

A new MSW tipping building will be constructed at the site, with a capacity to accept up to 1,500 tons per day of MSW delivered to the facility by truck. The tipping building is expected to be approximately 50,000 square feet in floor area and will connect with an existing 103,000 SF building. The tipping building will be designed to allow waste delivery trucks to drive into the building to dump loads of waste material for processing. Front-end loaders will load the MSW into a feed hopper for the MSW processing equipment. The existing building on site adjacent to the proposed tipping building will be used for the processing of MSW. The existing building will be modified as required to house the MSW processing equipment used to extract recyclable material from MSW received. It is expected that approximately 20% of the MSW received by the facility will be reclaimed and recycled. This existing building will also include a baler to bale and shrink wrap MSW after processing to remove recyclable materials. The baled, non-recyclable fraction of the MSW will be loaded in rail cars for shipment to out-of-state disposal sites, along with construction and demolition (C&D) residuals and bulky waste.

A processing facility will be built to dry biosolids to Class A specifications. Biosolids accepted will consist of thickened wet slurry biosolids with a solids content ranging from 5-10% and biosolids cake with a solids content ranging from 15-30%. The facility will utilize natural gas to dry the biosolids. The Project design details may be modified as they are refined through the permitting process.

The following describes the building ventilation, process equipment and other notable equipment associated with the Project that were included in the sound study:

- Rooftop, ground level, and/or sidewall inlet and exhaust fans on MSW Building, Glass Processing Building, and Biosolids Building;

- Biosolids exhaust stacks;
- Biosolids Building makeup air fan;
- Cooling towers at Biosolids Building;
- Front-end loader and tipping operations inside open garage door bays of MSW Building
- Truck trips (for traffic noise modeling)

This report provides a description of the applicable noise policy requirements, a brief explanation of noise terminology, a summary of the results of an ambient sound level monitoring program, and a discussion of the sound level modeling analysis for the proposed Project. Noise control options are discussed in order to meet the requirements of the MassDEP Noise Policy at residential locations.

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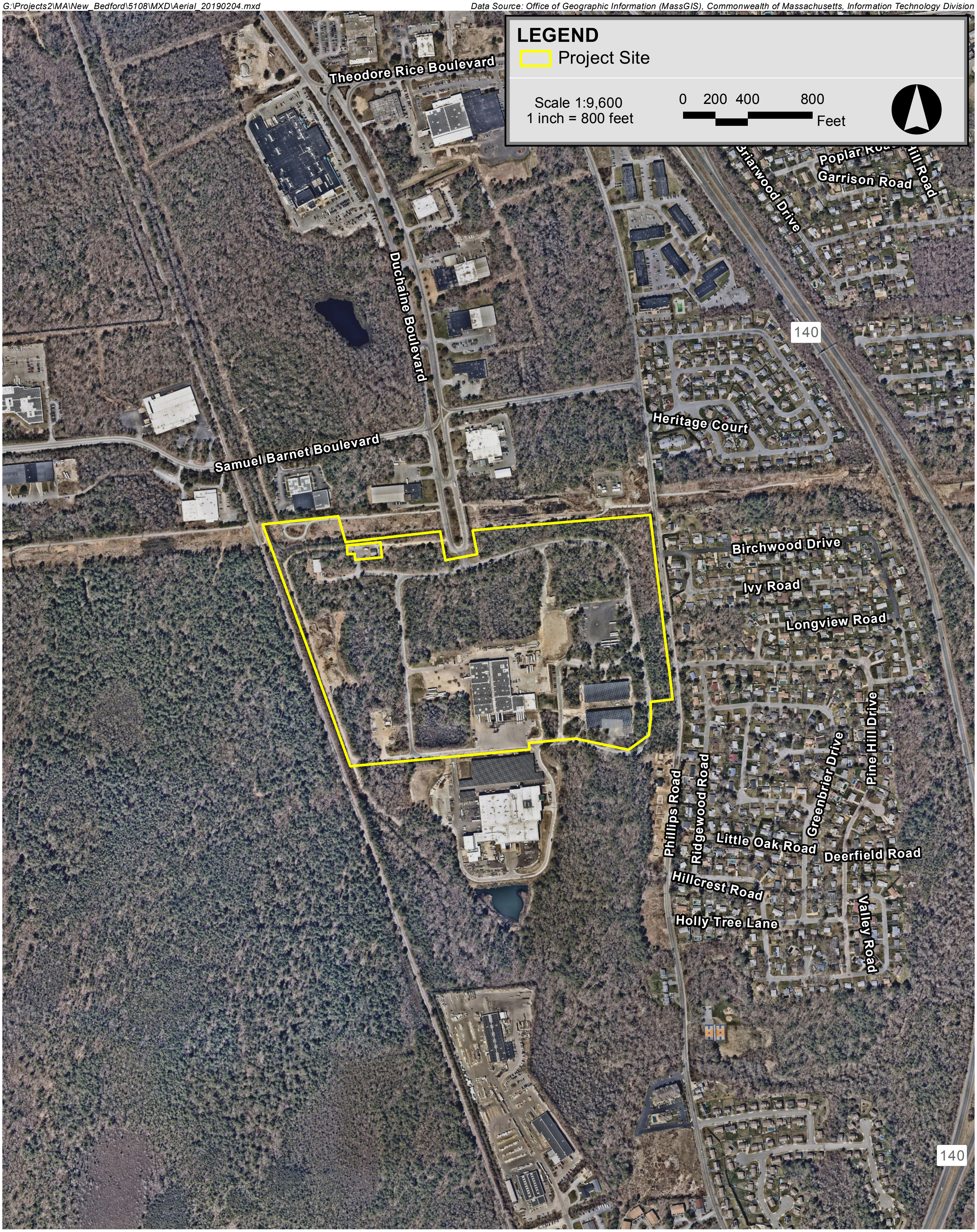
Data Source: Office of Geographic Information (MassGIS), Commonwealth of Massachusetts, Information Technology Division




**Parallel Products** **New Bedford, Massachusetts**

Epsilon ASSOCIATES INC.

**Figure 2-1**

*Aerial Locus Map*

# 3.0 SOUND METRICS

There are several ways in which sound levels are measured and quantified. All of them use the logarithmic decibel (dB) scale. The following information defines the sound level terminology used in this analysis.

The decibel scale is logarithmic to accommodate the wide range of sound intensities found in the environment. A property of the decibel scale is that the sound pressure levels of two or more separate sounds are not directly additive. For example, if a sound of 50 dB is added to another sound of 50 dB, the total is only a 3-decibel increase (53 dB), which is equal to doubling in sound energy but not equal to a doubling in decibel quantity (100 dB). Thus, every 3-dB change in sound level represents a doubling or halving of sound energy. Relative to this characteristic, a change in sound levels of less than 3 dB is imperceptible to the human ear.

Another mathematical property of decibels is that if one source of sound is at least 10 dB louder than another source, then the total sound level is simply the sound level of the higher-level source. For example, a sound source at 60 dB plus another sound source at 47 dB is equal to 60 dB.

A sound level meter (SLM) that is used to measure sound is a standardized instrument.[1] It contains "weighting networks" (e.g., A-, C-, Z-weightings) to adjust the frequency response of the instrument. Frequencies, reported in Hertz (Hz), are detailed characterizations of sounds, often addressed in musical terms as "pitch" or "tone". The most commonly used weighting network is the A-weighting because it most closely approximates how the human ear responds to sound at various frequencies. The A-weighting network is the accepted scale used for community sound level measurements; therefore, sounds are frequently reported as detected with a sound level meter using this weighting. A-weighted sound levels emphasize middle frequency sounds (i.e., middle pitched – around 1,000 Hz), and de-emphasize low and high frequency sounds. These sound levels are reported in decibels designated as "dBA". Z-weighted sound levels are measured sound levels without any weighting curve and are otherwise referred to as "unweighted". Sound pressure levels for some common indoor and outdoor environments are shown in Figure 3-1.

Because the sounds in our environment vary with time they cannot simply be described with a single number. Two methods are used for describing variable sounds. These are exceedance levels and the equivalent level, both of which are derived from a large number of moment-to-moment A-weighted sound level measurements. Exceedance levels are values

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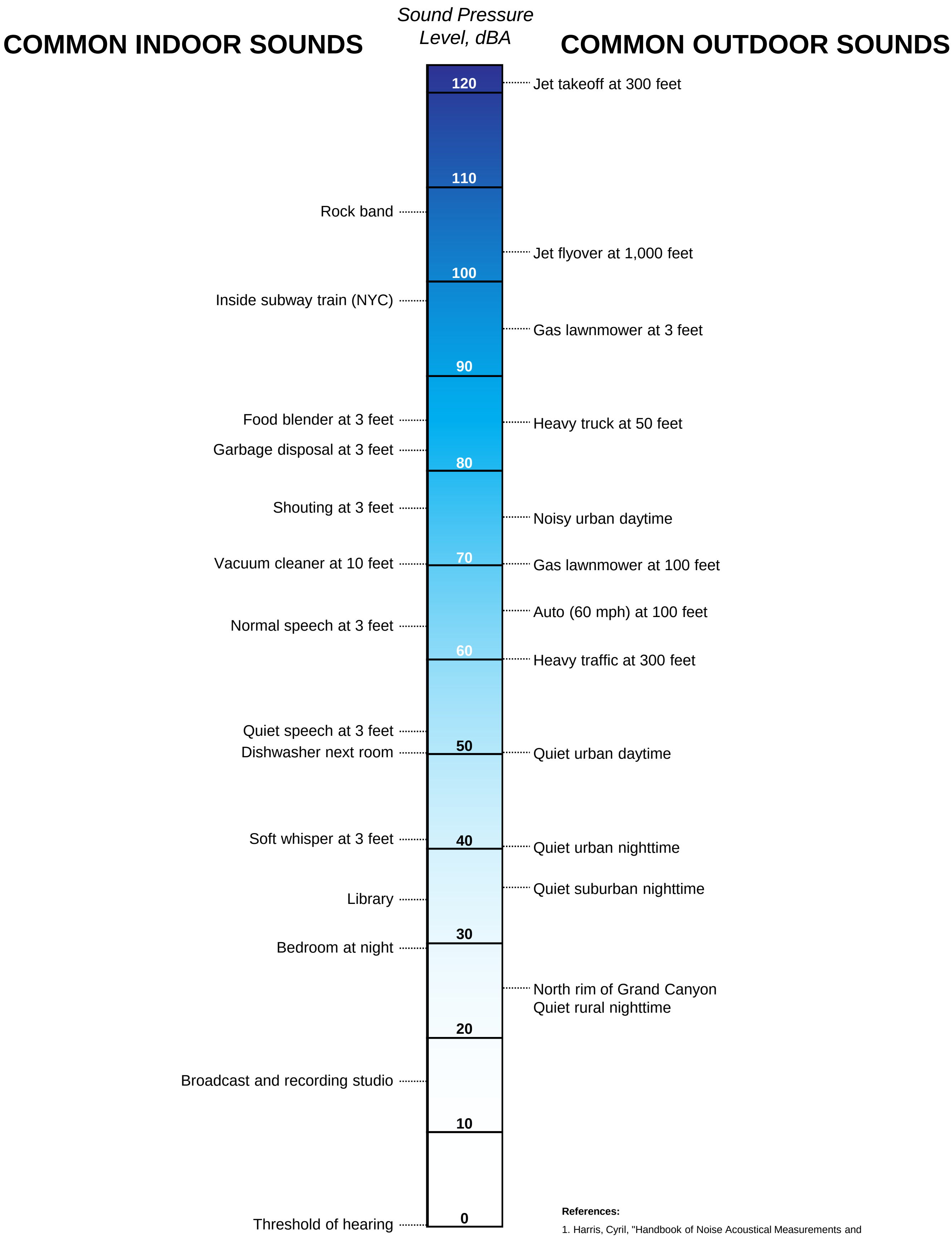
[1] *American National Standard Specification for Sound Level Meters*, ANSI S1.4-1983 (R2006), published by the Standards Secretariat of the Acoustical Society of America, Melville, NY.

from the cumulative amplitude distribution of all of the sound levels observed during a measurement period. Exceedance levels are designated $L_n$, where n can have a value between 0 and 100 in terms of percentage. Two sound level metrics that are reported in community sound monitoring are described below.

- $L_{90}$ is the sound level exceeded 90 percent of the time during the measurement period. The $L_{90}$ is close to the lowest sound level observed. It is essentially the same as the residual sound level, which is the sound level observed when there are no obvious nearby intermittent sound sources. The $L_{90}$ level is used to establish the "ambient" or "background" sound level as part of the MassDEP Noise Policy.

- $L_{eq}$, the equivalent level, is the level of a hypothetical steady sound that would have the same energy (*i.e.,* the same time-averaged mean square sound pressure) as the actual fluctuating sound observed. The equivalent level is designated $L_{eq}$ and is typically A-weighted. The equivalent level represents the time average of the fluctuating sound pressure, but because sound is represented on a logarithmic scale and the averaging is done with linear mean square sound pressure values, the $L_{eq}$ is mostly determined by loud sounds if there are fluctuating sound levels.




**References:**

1. Harris, Cyril, "Handbook of Noise Acoustical Measurements and Noise Control", p 1-10., 1998
2. "Controlling Noise", USAF, AFMC, AFDTC, Elgin AFB, Fact Sheet, August 1996
3. California Dept. of Trans., "Technical Noise Supplement", Oct, 1998

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**Figure 3-1**

**Common Indoor and Outdoor Sound Levels**

# 4.0 NOISE REGULATIONS

## 4.1 Federal Regulations

There are no federal community noise regulations applicable to this Project.

## 4.2 Massachusetts State Regulations

The Massachusetts Department of Environmental Protection (MassDEP) has the authority to regulate noise under 310 CMR 7.10, which is part of the Commonwealth's air pollution control regulations. Under MassDEP regulations, noise is considered to be an air contaminant and, thus, 310 CMR 7.10 prohibits "unnecessary emissions" of noise.

The MassDEP administers this regulation through its Noise Policy DAQC 90-001, dated February 1, 1990. The Noise Policy limits a source to a 10-dBA increase above the ambient sound measured (the $L_{90}$ sound level) at the property line for the site and at the nearest residences. According to the MassDEP, "Noise levels that exceed the criteria at the source's property line by themselves do not necessarily result in a violation or a condition of air pollution under MassDEP regulations (see 310 CMR 7.10). The agency also considers the effect of noise on the nearest occupied residence and/or building housing sensitive receptors".[2] In addition, "…[a] new noise source that would be located in an area in which housing or buildings containing other sensitive receptors could be developed in the future may be required to mitigate its noise impact in these areas."[2]

MassDEP's Noise Policy further prohibits "pure tone" conditions where the sound pressure level in one octave band is 3 dB or more than the sound levels in each of the two adjacent octave bands. A qualitative example of a source emitting a "pure tone" is a fan with a bad bearing that is producing an objectionable squealing sound.

## 4.3 Local Regulations

There are no local quantitative noise regulations applicable to this Project.

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2 Energy and Environmental Affairs. *Noise Pollution Policy Interpretation | MassDEP*. http://www.mass.gov/eea/agencies/massdep/air/programs/noise-pollution-policy-interpretation.html. Accessed October 2016.

# 5.0 EXISTING SOUND LEVELS

The Project is to be located at 100 Duchaine Boulevard in New Bedford, Massachusetts. The property is bordered by residential neighborhoods to the northeast, east and southeast, with a new residential development along the immediate southeast property line. Parallel Products has purchased two of the newly built houses located on the west side of Phillips Road and closest to the industrial property to the southeast of the site. To the north, west and south, the property is bordered by industrial/commercial properties. The site currently consists of one industrial building and several surface parking lots.

## 5.1 Baseline Sound Environment

An existing sound level survey was conducted during the daytime and nighttime hours to characterize the existing "baseline" acoustical environment in the vicinity of the site. Two long-term continuous sound level monitoring stations were deployed for 7-days to:

1. Establish representative A-weighted broadband ambient sound pressure levels, for evaluating requirements of the MassDEP policy limit of a 10 dBA increase due to the proposed Project; and

2. Establish representative octave-band ambient sound pressure levels to identify any existing "pure tones," as defined by MassDEP, and evaluate whether the addition of modeled sound levels from the proposed Project to these background sound levels may introduce or exacerbate existing "pure tones" in the community.

Only measurement periods during, or affected by, precipitation were excluded from the analysis. This approach is consistent with ANSI Standard S12.18-1994 (R2009).

In addition, two short-term (spot) sound level measurements were performed at two locations near the site. These measurements took place during the daytime and nighttime in residential areas that extended further away from the Project site. Daytime measurements were conducted between 10 AM and 3 PM to avoid influence from local commuter traffic. Nighttime measurements occurred between 12 AM and 3 AM to capture the quietest portion of the night. The short-term monitoring intervals were 20 minutes in duration.

## 5.2 Sound Level Measurement Locations

The selection of the sound level measurement locations was based upon a review of aerial photography and online resources. No schools, hospitals, or similar sensitive receptors were found near the Project area. Nearby residences were identified and accounted for in selecting proposed monitoring locations. The measurement program consisted of two (2) long-term continuous measurement locations and two (2) short-term (spot) measurement locations. The measurement locations are representative of the ambient baseline sound level environment around the Project. Coordinates of the monitoring locations are presented in Table 5-1. These measurements locations are depicted in Figure 5-1, and are described below.

- **Location CM1** is located near the Project property line immediately southeast of the Project. This location is representative of the newly built residences located next to the property line and immediately west of Phillips Road. This is also representative of all the residences that lie to the east of Phillips Road. Continuous hourly one-third octave-band and broadband sound level data was collected at this location. Noise sources at this location include on-site vehicle traffic and distant noise from Eversource, immediately south of the Project site. Vehicle traffic along Phillips Road, birds, insects and planes overhead were also all observed at this location.
- **Location CM2** is located near the Project property line immediately northwest of the Project. This location is representative of the industrial properties to the north, west and south of the Project. Continuous hourly one-third octave-band and broadband sound level data was collected at this location. Noise sources at this location included nearby noise from Farland Corp. and work that Eversource was carrying out nearby. Distant vehicle traffic, birds, insects and planes overhead were also observed at this location.
- **Location RML3** is located to the northeast of the Project at the intersection of Industrial Park Road and Phillips Road. This location is representative of all the residences to the northeast of the Project, that are east of Phillips Road and back nearby Heritage Drive. One-third octave-band and broadband sound level data were collected for 20 minutes in duration, during the daytime and nighttime at this location. Noise sources at this location included frequent vehicle traffic along Phillips Road and Industrial Park Road. Rustling vegetation, birds, insects and planes overhead were also all observed at this location.
- **Location RML4** is located to the southeast of the Project at the entrance to the City of New Bedford Pine Hill Park on Phillips Road. This location is representative of the park and all the residences to the southeast of the Project, that are to the west and east of Phillips Road. One-third octave-band and broadband sound level data was collected for 20 minutes in duration, during the daytime and nighttime at this location. Noise sources at this location included frequent vehicle traffic along Phillips Road and those entering and leaving the park. Rustling vegetation, children playing at the park, birds, insects and planes overhead were also all observed at this location.

Data Source: Office of Geographic Information (MassGIS), Commonwealth of Massachusetts, Information Technology Division


Parallel Products New Bedford, Massachusetts

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**Figure 5-1**

*Sound Level Monitoring Locations*

Figure 5-2 Photo of Sound Level Measurement Location CM1 (facing southeast)

Figure 5-3 Photo of Sound Level Measurement Location CM2 (facing north)

Figure 5-4 Photo of Sound Level Measurement Location RML3 (facing north)


Figure 5-5 Photo of Sound Level Measurement Location RML4 (facing southwest)

Table 5-1 GPS Coordinates –Sound Level Measurement Locations

| Location | Coordinates (UTM-19N NAD83) | |
|---|---|---|
| | Easting (m) | Northing (m) |
| CM1 | 337911.14 | 4619989.37 |
| CM2 | 337280.48 | 4620296.25 |
| RML3 | 337911.89 | 4620634.82 |
| RML4 | 337994.24 | 4619457.17 |

## 5.3 Measurement Methodology

A comprehensive sound level measurement program was developed to quantify the ambient sound levels around the Project. Continuous A-weighted and octave-band measurements (24 hours/day) were made concurrently at two locations over approximately a one-week period from Tuesday, June 26, 2018 through Tuesday, July 3, 2018. The long-term monitors were generally unattended, with personal observations made by a field technician during deployment, a nighttime site visit, and demobilization. Meteorological data was collected concurrently nearby, only three miles to the south at the New Bedford Regional Airport National Weather Service (NWS) station provided by the National Centers for Environmental Information (NCEI), for the duration of the measurement program. All sound level data and meteorological data collected during the program are included in the ambient analysis and presented in this report.

Two short-term (spot) sound level measurements occurred in addition, at two locations near the site. These measurements took place during the daytime and nighttime in residential areas that extended further away from the Project site to the northeast and southeast. Daytime measurements were conducted between 2 PM and 3 PM to avoid influence from local commuter traffic. Nighttime measurements occurred between 12 AM and 1:30 AM to capture the quietest portion of the night. The short-term monitoring intervals were 20 minutes in duration. The measurements were made under low wind conditions, no precipitation, and dry roadway surfaces. Each measurement was attended by Epsilon field personnel.

## 5.4 Measurement Equipment

Two Larson Davis (LD) Model 831 integrating sound level meters, tripod-mounted at a height of approximately five feet (1.5 meters) above ground level and fitted with the manufacturer's environmental windscreen, were used to collect continuous background sound pressure level data. An additional Larson Davis (LD) Model 831 integrating sound level meter was used with respect to the short-term ("spot") measurements. Both continuous background meters, were connected to a microphone via an extension cable and housed in an environmental suitcase, that was programmed to log statistical A-weighted broadband and unweighted octave-band sound level data ($L_1$, $L_{10}$, $L_{50}$, $L_{90}$, $L_{max}$, and $L_{eq}$) over one-hour intervals with a one-minute time history. The short-term ("spot") sound level meter was tripod-mounted at a height of five feet (1.5 meters) above ground level (AGL) with a fitted manufacturer's environmental windscreen. Capable of data logging, this short-term meter was programmed to log statistical data for each 20-minute sampling period and a one-minute time history, with the following parameters: $L_1$, $L_{10}$, $L_{50}$, $L_{90}$, $L_{max}$, and $L_{eq}$.

All sound monitoring instrumentation met the "Type 1 - Precision" requirements set forth in ANSI S1.4-1983 as specified in the ANSI S12.18-1994 methodology as well as those in ANSI S1.11-2004 (octave filter standard) for acoustical measuring devices.

## 5.5 Baseline Ambient Sound Levels

The ambient sound level environment consists primarily of nearby vehicle traffic from Phillips Road, traffic on Route 140 and other roadways, nearby industrial work/construction noise during the daytime, children playing at the park, rustling vegetation, occasional aircraft, birds, and insects.

### *5.5.1 Short-term Sound Levels*

Short-term sound levels were measured during the daytime on June 26, 2018 and the nighttime of July 3, 2018, respectively. A brief summary of the measurement results is presented herein.

The baseline sound level monitoring results are presented in Table 5-2 for the short-term ("spot") and are summarized below. A MassDEP-defined "pure tone" was measured at Location RML3 as part of the existing ambient environment. These are 20-minute sampling periods at each location with a one-minute time history, for both daytime and nighttime respectively. Weather conditions corresponding to the ambient measurements are displayed in Table 5-3.

- ♦ The daytime residual background ($L_{90}$) measurements for RML3 ranged from 47 to 62 dBA;
- ♦ The nighttime residual background ($L_{90}$) measurements for RML3 ranged from 42 to 48 dBA;
- ♦ The daytime residual background ($L_{90}$) measurements for RML4 ranged from 50 to 59 dBA;
- ♦ The nighttime residual background ($L_{90}$) measurements for RML4 ranged from 33 to 40 dBA.

Table 5-2 Summary of Baseline Short-Term Sound Level Measurements – June 26 & July 3, 2018

| Period | Location | Date | Start Time | $L_{eq}$ | $L_{max}$ | $L_{90}$ | $L_{90}$ Sound Pressure Levels by Octave-Band Center Frequency (Hz) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 31.5 | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
| | | | | dBA | dBA | dBA | dB | dB | dB | dB | dB | dB | dB | dB | dB |
| Day | RML3 | 6/26/18 | 2:09 PM | 67 | 86 | 52 | 58 | 56 | 53 | 47 | 46 | 48 | 45 | 37 | 30 |
| | RML4 | 6/26/18 | 2:34 PM | 63 | 77 | 53 | 62 | 58 | 54 | 50 | 48 | 49 | 45 | 39 | 33 |
| Night | RML3 | 7/3/18 | 12:11 AM | 52 | 66 | 48 | 54 | 49 | 46 | 41 | 36 | 32 | 25 | 46[1] | 21 |
| | RML4 | 7/3/18 | 12:43 AM | 50 | 67 | 35 | 47 | 46 | 41 | 32 | 32 | 30 | 22 | 20 | 19 |

Notes:

1. Measured existing "pure tone," likely due to insects.

Table 5-3 Baseline Measurement Weather Conditions – June 26 & July 3, 2018

| | Date | Temp[1] | RH[1] | Sky[1] | Wind[1] |
|---|---|---|---|---|---|
| **Day** | Tuesday, June 26, 2018 | 76 °F | 30% | Clear | Calm |
| **Night** | Tuesday, July 3, 2018 | 69 °F | 100% | Fair | Calm |

Notes:

1. Observed by Epsilon personnel.

### *5.5.2 Long-term Sound Levels*

Long-term sound levels were measured continuously from Tuesday, June 26, 2018 through Tuesday, July 3, 2018. A brief summary of the measurement results is presented herein.

Continuous 1-hour sampling periods at each location with a one-minute time history were measured at two locations. Daytime is defined as the operational hours between 7 AM and 10 PM. Nighttime is defined as the operational hours between 10 PM and 7 AM. Hourly A-weighted broadband sound pressure level data from the continuous ambient monitoring stations at locations CM1 & CM2 are presented in Appendix B. Periods of precipitation totaling approximately 16 hours as recorded at the nearby New Bedford Regional Airport National Weather Service (NWS) station, were excluded from the dataset. These precipitation periods are shown in Appendix C.

- The hourly daytime residual background ($L_{90}$) measurements for CM1 ranged from 38 to 53 dBA;
- The hourly nighttime residual background ($L_{90}$) measurements for CM1 ranged from 29 to 48 dBA;
- The hourly daytime residual background ($L_{90}$) measurements for CM2 ranged from 32 to 49 dBA;
- The hourly nighttime residual background ($L_{90}$) measurements for CM2 ranged from 29 to 43 dBA.

## 5.6 Establishment of Background Sound Levels

A-weighted broadband (dBA) and unweighted octave-band (dB) background sound levels used to evaluate the Project and requirements of the MassDEP Noise Policy are presented in Table 5-4.

As observed by the Epsilon field staff, sound levels at both locations during the measurements in the summer months of June & July, 2018 were significantly affected by insect noise. Sound from insects likely affects the background in this area for many months of the year due to the forested landscape. During some periods of the year, sound from insects and birds will not be present (i.e., winter); therefore, to more closely replicate sound levels observed at the same monitoring locations during these periods ("quiet seasons"), a high-frequency natural sound (HFNS) filter was applied to the measured one-third octave-band data from which a new broadband sound level was calculated. This technique removes all sound energy above the 1,250 Hertz frequency band. The methodology for the filtration process was as specified in ANSI/ASA S12.100-2014 and the sound pressure levels presented in this report using this methodology are indicated as ANS-weighted levels (presented in dBA).

At Locations CM1 and CM2 the daily lowest ANS-weighted daytime and lowest ANS-weighted nighttime $L_{90}$ sound levels were averaged to determine the representative background sound level at each location. These representative background levels were used to evaluate sound level increases at each location.

Epsilon reviewed the short-term sound level monitoring results and determined that those sound levels were higher than the representative average lowest background levels from the long-term locations. Therefore, the representative average ANS-weighted $L_{90}$ sound levels measured at the long term locations were conservatively used at all locations to evaluate sound level increases.

## Table 5-4 Summary of Average Daytime[1] & Nighttime[2] Ambient $L_{90}$ Sound Level Measurements

| Period | Location | Representative ANS $L_{90}$[3] | Date | Start Time | Measured $L_{90}$ | $L_{90}$[4] Sound Pressure Levels by Octave-Band Center Frequency (Hz) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 31.5 | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
| | | dBA | | | dBA | dB | dB | dB | dB | dB | dB | dB | dB | dB |
| Day | CM1 | 41 | 6/30/18 | 2:00 PM | 41 | 54 | 53 | 39 | 37 | 37 | 36 | 31 | 25 | 21 |
| | CM2 | 35 | 6/30/18 | 10:00 AM | 35 | 50 | 43 | 35 | 35 | 32 | 28 | 22 | 21 | 19 |
| Night | CM1 | 34 | 7/3/18 | 4:00 AM | 34 | 48 | 45 | 37 | 35 | 31 | 27 | 22 | 19 | 19 |
| | CM2 | 33 | 7/2/18 | 1:00 AM | 33 | 51 | 41 | 34 | 36 | 31 | 25 | 18 | **22**[5] | 19 |

Notes:

1. 'Daytime' defined to be between the hours of 7AM and 10PM.
2. 'Nighttime' defined to be between the operational hours of 10PM and 7AM.
3. Representative broadband ANS-weighted $L_{90}$ (dBA) is the average of the daily lowest ANS-weighted daytime and lowest ANS-weighted nighttime $L_{90}$ sound levels.
4. Measured octave-band values correspond to an hourly period that matches the average ANS-weighted $L_{90}$ sound level for both daytime and nighttime.
5. Measured existing "pure tone," likely due to insects.

# 6.0 MODELED STATIONARY SOURCE SOUND LEVELS

## 6.1 Overview of Proposed Project Sound Sources and Controls

The proposed Project and majority of the associated on-site equipment are expected to operate 24 hours/day and 7 days per week, with waste deliveries accepted from 5 AM until 9 PM.

At this stage of the Project, key components for the facility have been selected, however some equipment selection may be refined as the design process progresses. Reference sound level data used in the noise model includes vendor data, as well as representative data from sound level measurements of a similar facility or equipment where no data are provided by the manufacturer.

### *6.1.1 Proposed Sound Sources*

The primary sources of sound from the Project include MSW and C&D tipping and handling, general ventilation equipment, process ventilation equipment at the Biosolids Building, and four cooling towers. A tabular summary of the modeled mechanical equipment proposed for the Project is presented in Table 6-1 and are further described herein.

#### MSW Building

Three front-end loaders will be located inside the new MSW Building (the tipping area) and will move MSW into a feed hopper for transfer to the existing building which will be used for processing of the MSW. The tipping/dumping of materials onto the new MSW Building floor and subsequent scooping and movement of the materials by the front-end loader will produce sound through three open garage door bays. For the purpose of conservative modeling, the doors are considered to be open at all times, although this is not the case in practice. Sound pressure levels at a reference distance of this activity were measured by Epsilon at a similar facility and used to calculate a sound power level entered into the acoustic model. The calculated sound power levels for this source are presented in Table 6-2.

Based on the current conceptual design, the new and existing MSW Buildings will also have seven (7) exhaust fans located on the rooftop. These fans each have a capacity of 24,000 CFM, and sound power levels of the New York Blower (NYB) unit used in the acoustic model are presented in Table 6-2.

#### Glass Processing Building

The Glass Processing Building, which is currently under construction, was assumed to have eight (8) sidewall inlet/exhaust fans for general ventilation, based on the current conceptual design. The acoustic model assumed the Glass Building fans range from 50,400 CFM to 58,600 CFM. The sound power levels used for modeling are presented in Table 6-2.

**Biosolids Building**

Sound sources associated with the Biosolids Building include two dewatering process exhaust fans, a makeup air fan located at ground level, a biofilter exhaust stack equipped with an induced draft (ID) fan located at ground level, and four cooling towers. The dewatering process exhaust fans are located on the building rooftop, and all other equipment is located on the western side of the building, in order to shield the residential neighborhood to the east. Sound power levels of the rooftop and induced draft fans and makeup air fan and sound pressure levels of the cooling towers were provided by the representative manufacturer and are presented in Table 6-1.

### *6.1.2 Summary of Noise Controls*

In order to keep site sound levels at a minimum, the Project plans to make use of an electric rail car pusher to move railway cars staged on-site.

The sidewall inlet/exhaust fans on the Glass Processing Building will be no louder than the sound power level presented in Table 6-3. This may be achieved through low noise fans, or by utilizing fan silencers.

The exhaust fans on the Biosolids building will be fitted with fan silencers as described in Table 6-3, or low noise fans capable of achieving the same resulting sound level may be utilized.

The induced draft fan at the biofilter stack located west of the Biosolids building will be fitted with a silencer as described in Table 6-3, or a lower noise unit capable of achieving the same resulting sound level as the silenced stack may be utilized.

The ground mounted makeup air handling unit located on the ground level of the west side of the Biosolids building will be a low noise unit capable of achieving the sound power level presented in Table 6-3.

A 100-foot long 24-foot tall "L-shaped" sound barrier wall will be included along the southwestern corner of the Biosolids building as showing in Figure 6-1. The purpose of this wall is to shield the residential area to the southeast of the site from sound generated by the cooling towers and other ground level equipment located on the west side of the biosolids building. As the design of project equipment progresses, specifications of mechanical equipment may change, and compliance with the sound limits may be achieved through different methods (i.e. in lieu of a sound barrier wall, quieter cooling towers may be utilized).

### Table 6-1 Modeled Noise Sources

| Noise Source | Manufacturer/ Model | Quantity | Approximate Location | Size/Capacity |
|---|---|---|---|---|
| General Rooftop Exhaust Fans | New York Blower | 7 | MSW tipping and processing rooftops | 24,000 cfm |
| Biosolids Exhaust Fans | Cook 365UCIC | 2 | New Biosolids Building roof | 25,000 cfm |
| Biofilter Stack Exhaust and ID Fan | Hartzell | 1 | On the west side the new Biosolids Building | 40 ft stack |
| Cooling Tower | CTS T-2400 | 4 | Ground level west of the new Biosolids Building | 91,030 cfm |
| Makeup Air Fan | Governair ITF-RDH0 | 1 | Ground level west of the new Biosolids Building | 47,500 cfm |
| MSW Tipping and Loading | NA | 1 | Open garage door bays, west side of new MSW Building | NA |
| Glass Intake Fan | Multi-Wing | 3 | Glass Processing Sidewall | 50,400 cfm |
| Glass Exhaust Fan | Multi-Wing | 5 | Glass Processing Sidewall | 50,400 cfm |

### Table 6-2 Modeled Sound Power Levels per Noise Source

| Noise Source | Broadband (dBA) | Sound Level (dB) per Octave-Band Center Frequency (Hz) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 31.5 | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| General Rooftop Exhaust Fan | 93 | 98 | 98 | 95 | 95 | 92 | 88 | 82 | 74 | 68 |
| Biosolids Exhaust Fan | 94 | 97 | 97 | 99 | 94 | 90 | 90 | 84 | 75 | 68 |
| Biofilter Stack Exhaust and ID Fan | 100[1] | 79 | 79 | 92 | 96 | 98 | 96 | 92 | 86 | 77 |
| Cooling Tower | 99[2] | 103 | 103 | 102 | 100 | 96 | 94 | 90 | 86 | 83 |
| Makeup Air Fan | 96[3] | 88 | 88 | 85 | 94 | 95 | 90 | 89 | 84 | 81 |
| MSW Tipping and Loading | 110[4] | 107 | 109 | 107 | 107 | 105 | 106 | 102 | 99 | 95 |
| Glass Intake & Exhaust Fan | 87[5] | 108 | 108 | 97 | 87 | 80 | 76 | 73 | 74 | 72 |

Notes:

1. Octave band data for biofilter stack not provided, octaves were estimated based on data from similar equipment.
2. Octave band data for cooling towers not provided, octaves were estimated based on data from similar equipment.
3. Assumed low-noise unit. Broadband and octave bands are assumed to be 5 dB lower than standard unit.
4. Epsilon measurements of similar operations at an existing facility.
5. Assumed low-noise fans. Broadband and octave bands are assumed to be 5 dB lower than standard unit. This could be achieved through low noise fans or fan silencers.

### Table 6-3 Sound Attenuation Applied to Specific Noise Sources

| Noise Source | Form of Mitigation | Insertion Loss (dB) per Octave-Band Center Frequency (Hz) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 31.5 | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| Biosolids Exhaust Fan | Fan Silencer[1] | 4[2] | 4 | 8 | 15 | 26 | 33 | 25 | 17 | 14 |
| Biofilter Stack Exhaust and ID Fan | Silencer[3] | 0[5] | 6 | 13 | 26 | 40 | 19 | 14 | 13 | 13 |
| Cooling Towers | Noise Barrier Wall | - | - | - | - | - | - | - | - | - |

Notes:
1. Octave-band attenuation from Ruskin Sound Control Model XFA Acoustical Diffuser.
2. No data provided. Assumed level based on 63 Hz insertion loss.
3. Silex JB-24 octave-band insertion loss data.

## 6.2 Modeling Methodology

The noise impacts associated with the proposed Project were predicted using the CadnaA noise calculation software developed by DataKustik GmbH. This software uses the ISO 9613-2 international standard for sound propagation (Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation). The benefits of this software are a refined set of computations due to the inclusion of topography, ground attenuation, multiple building reflections, drop-off with distance, and atmospheric absorption. The CadnaA software allows for octave-band calculation of sound from multiple sources as well as computation of diffraction.

Inputs and significant parameters employed in the model are described below:

- *Site Plan:* The Project Site Plan provided the locations and dimensions of key inputs into the model. These drawings are included in this report as Attachment A.

- *Modeling Locations:* Sound level modeling was conducted at four residential locations RES-1 through RES-4. Residential modeling locations 1 through 4 are representative of the closest residential property lines to the northeast, east, and southeast of the Project. Parallel Products has purchased two of the newly built houses located on the west side of Phillips Road to the southeast of the site, and therefore Receptor RES-4 has been placed at the closest residential property line not owned by the Project. The four residential modeling locations are shown in Figure 6-1. All receptors were modeled with a height of 5 feet above ground level (AGL) to mimic the ears of a typical standing observer.

- *Terrain Elevation:* Elevation contours for the modeling domain were directly imported into CadnaA which allowed for consideration of terrain shielding where appropriate. The terrain height contours for the modeling domain were generated from elevation information derived from the National Elevation Dataset (NED) developed by the U.S. Geological Survey.

- *Source Sound Levels:* Broadband and octave-band sound power levels (when available) for the potential noise sources for the Project presented in Tables 6-2 were input in the model.

- *Meteorological Conditions:* A temperature of 10°C (50°F) and a relative humidity of 70% was assumed in the model.

- *Ground Attenuation:* Spectral ground absorption was calculated using a G-factor of 0 for the Project site which corresponds to "hard ground". For all other offsite areas, a G-factor of 0.5 was used which corresponds to "mixed ground".

- *Directivity:* A directivity correction was applied to the biofilter exhaust stack.

Sound pressure levels due to the operation of all equipment operating simultaneously at full load were modeled at the four (4) sound level modeling locations. This is a conservative modeling assumption which will result in higher predicted sound levels relative to various actual part-load and intermittent operation of some of the sources.

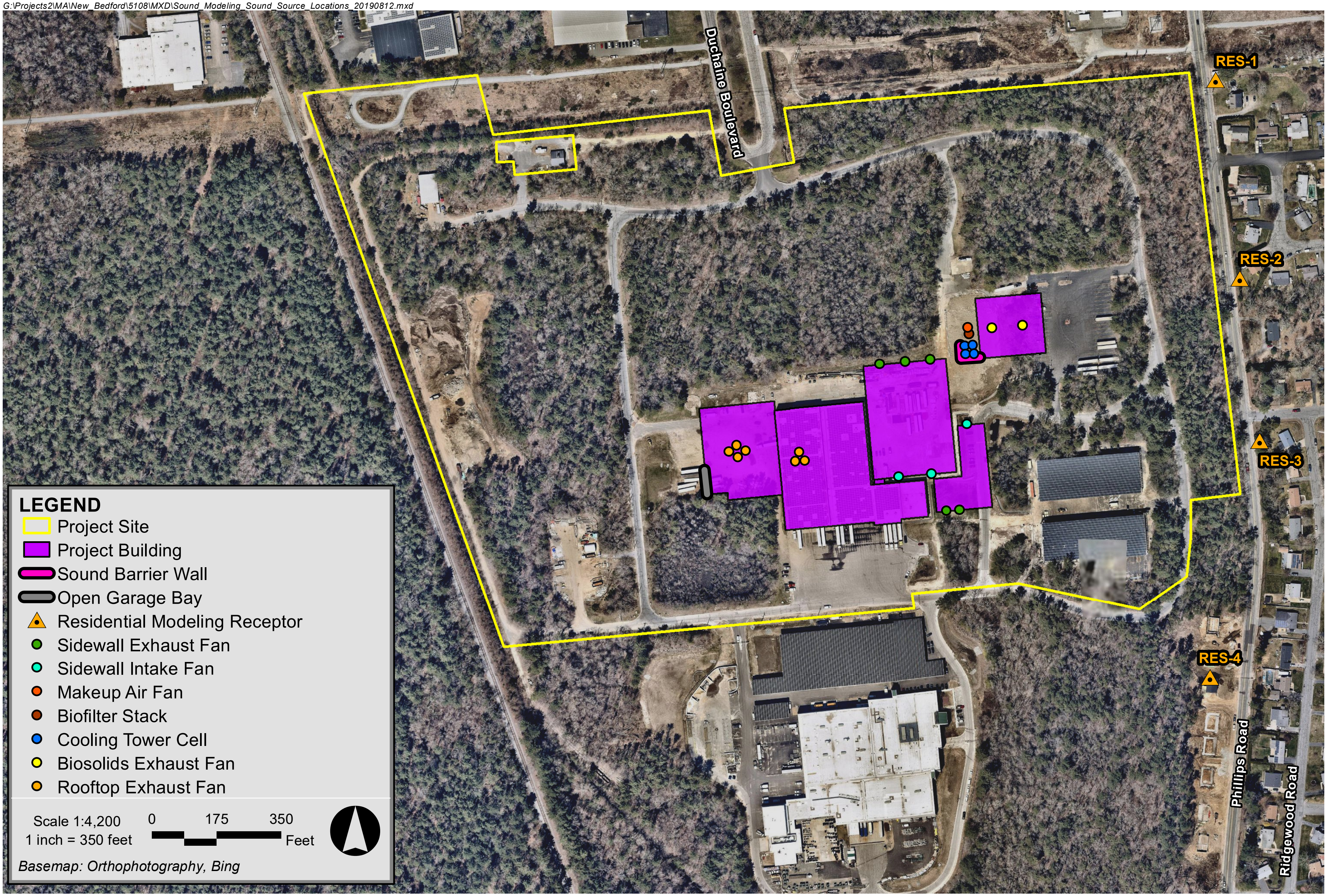
Several modeling assumptions inherent in the ISO 9613-2 calculation methodology, or selected as conditional inputs by the user, were implemented in the CadnaA model to ensure conservative results (i.e., higher sound levels), and are described below:

- As per ISO 9613-2, the model assumed favorable conditions for sound propagation, corresponding to a moderate, well-developed ground-based temperature inversion, as might occur on a calm, clear night or equivalently downwind propagation.

- Meteorological conditions assumed in the model (T = 10°C and RH = 70%) were selected to minimize atmospheric attenuation in the 500 Hz and 1 kHz octave-bands where the human ear is most sensitive.

- No additional attenuation due to tree shielding, air turbulence, or wind shadow effects was considered in the model.

G:\Projects2\MA\New_Bedford\5108\MXD\Sound_Modeling_Sound_Source_Locations_20190812.mxd




**Parallel Products** **New Bedford, Massachusetts**

Epsilon ASSOCIATES INC.

**Figure 6-1**

*Sound Level Modeling and Sound Source Locations*

## 6.3 Sound Level Modeling Results

Table 6-4 shows the predicted daytime and nighttime "Project Only" broadband (dBA) sound levels at the discrete modeling points. The daytime and nighttime sound levels are the result of all sources discussed in Section 6.1 operating simultaneously. Although there will be variation in operations between daytime and nighttime, the modeling has conservatively assumed full daytime operations for both scenarios. These are exterior sound levels. Sound levels inside any receiving structure will be lower than shown in the table. In the residential areas, the predicted daytime and nighttime Project Only sound levels range from 39 to 42 dBA. In the industrial areas, the predicted Project Only sound levels are higher than those at the residential locations.

### Table 6-4 CadnaA Discrete Point Sound Level Modeling Results

| Modeling Location ID | Modeling Location Description | Daytime and Nighttime Project Only Sound Level[1] (dBA) |
|---|---|---|
| RES-1 | Residential property line immediately northeast of the Project | 39 |
| RES-2 | Residential property line immediately east of the Project | 41 |
| RES-3 | Residential property line immediately east of the Project | 41 |
| RES-4 | Residential property line southeast of the Project | 42 |

Notes:

1. Sound pressure levels are rounded to the nearest whole decibel.

# 7.0 EVALUATION OF STATIONARY SOURCE SOUND LEVELS

According to the MassDEP Noise Policy, a source cannot result in an increase in the ambient sound level ($L_{90}$) by more than 10 dBA at the property line of the site at the nearest residences. In addition to limiting the increase in the ambient sound level, the Noise Policy prohibits "pure tone" conditions where the sound pressure level in one octave band frequency is at least 3 dB greater than the sound levels in each of two adjacent frequency bands.

A daytime broadband sound level evaluation at the residences is presented in Table 7-1, and a nighttime broadband sound level evaluation at the residences is presented in Table 7-2. The ambient sound level for modeling locations RES-1 through RES-4 are estimated based on the 7 day average of the lowest daytime and nighttime hourly $L_{90}$ levels measured at CM-1. A complete description of the ambient sound level monitoring is presented in Section 5 of this report.

The predicted future total sound levels (Project + Background) are at or below the MassDEP criterion of 10 dBA over the measured ambient ($L_{90}$) sound levels at the four (4) modeled residential receptors.

Sound levels at the industrial property lines to the north, west, and south of the project were examined, however results at these locations have not been evaluated with respect to the MassDEP Noise Policy because these locations are uninhabited and/or industrial.

As discussed in Section 4.2, the MassDEP declares that "Noise levels that exceed the criteria at the source's property line by themselves do not necessarily result in a violation or a condition of air pollution under MassDEP regulations"; therefore, the critical point of evaluation is at a residential neighborhood. All closest residential property lines are predicted to be below the MassDEP 10 dBA limit. At the four residential modeling receptors, the increase in ambient sound levels range from 6-8 dBA.

The Project is not predicted to create a "pure tone" per the MassDEP Noise Policy when combined with existing background sound levels at any of the four residential modeling locations as shown in Tables 7-3 and 7-4.

Table 7-1 Residential Daytime Broadband Sound Level Evaluation of the MassDEP Noise Policy

| Modeling Location ID | Description | Existing Daytime Sound Level[1] [$L_{90}$] (dBA) | Project Only Sound Level[1] (dBA) | Future $L_{90}$ Total Sound Level[1] (dBA) | Increase Over Background (dBA) | Meets MassDEP Noise Policy?[2] |
|---|---|---|---|---|---|---|
| RES-1 | Residential property line immediately northeast of the Project | 41 | 39 | 43 | 2 | Yes |
| RES-2 | Residential property line immediately east of the Project | 41 | 41 | 44 | 3 | Yes |
| RES-3 | Residential property line immediately east of the Project | 41 | 41 | 44 | 3 | Yes |
| RES-4 | Residential property line immediately southeast of the Project | 41 | 42 | 44 | 3 | Yes |

Notes:
1. Only whole numbers are shown; calculations performed using values with additional precision.
2. Refers to MassDEP A-weighted criteria of 10 dBA over background.

Table 7-2 Residential Nighttime Broadband Sound Level Evaluation of the MassDEP Noise Policy

| Modeling Location ID | Description | Existing Nighttime Sound Level[1] [$L_{90}$] (dBA) | Project Only Sound Level[1] (dBA) | Future $L_{90}$ Total Sound Level[1] (dBA) | Increase Over Background (dBA) | Meets MassDEP Noise Policy?[2] |
|---|---|---|---|---|---|---|
| RES-1 | Residential property line immediately northeast of the Project | 34 | 39 | 40 | 6 | Yes |
| RES-2 | Residential property line immediately east of the Project | 34 | 41 | 42 | 8 | Yes |
| RES-3 | Residential property line immediately east of the Project | 34 | 41 | 42 | 8 | Yes |
| RES-4 | Residential property line immediately southeast of the Project | 34 | 42 | 42 | 8 | Yes |

Notes:

1. Only whole numbers are shown; calculations performed using values with additional precision.
2. Refers to MassDEP A-weighted criteria of 10 dBA over background.

## Table 7-3 Residential Daytime "Pure Tone" Evaluation of the MassDEP Noise Policy

| Modeling Location ID | Description | Sound Level[1] (dB) per Octave-Band Center Frequency (Hz) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 31.5 | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| RES-1 | Residential property line immediately northeast of the Project | 59 | 58 | 47 | 42 | 39 | 38 | 32 | 25 | 21 |
| RES-2 | Residential property line immediately east of the Project | 59 | 59 | 48 | 43 | 40 | 39 | 33 | 26 | 21 |
| RES-3 | Residential property line immediately east of the Project | 61 | 60 | 49 | 43 | 40 | 39 | 33 | 26 | 21 |
| RES-4 | Residential property line southeast of the Project | 62 | 61 | 49 | 42 | 41 | 39 | 34 | 26 | 21 |

Notes:

1. Sound pressure levels are rounded to the nearest whole decibel.

## Table 7-4 Residential Nighttime "Pure Tone" Evaluation of the MassDEP Noise Policy

| Modeling Location ID | Description | Sound Level[1] (dB) per Octave-Band Center Frequency (Hz) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 31.5 | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| RES-1 | Residential property line immediately northeast of the Project | 58 | 57 | 46 | 42 | 38 | 34 | 27 | 20 | 19 |
| RES-2 | Residential property line immediately east of the Project | 58 | 58 | 48 | 43 | 39 | 36 | 29 | 21 | 19 |
| RES-3 | Residential property line immediately east of the Project | 60 | 59 | 48 | 43 | 39 | 36 | 29 | 20 | 19 |
| RES-4 | Residential property line immediately southeast of the Project | 61 | 61 | 49 | 42 | 39 | 36 | 30 | 22 | 19 |

Notes:

1. Sound pressure levels are rounded to the nearest whole decibel.

# 8.0 ON-SITE TRUCK ACTIVITY

## 8.1 Overview of Proposed Project Trucking Activity

The proposed Project is expected to accept truck deliveries from 5 AM until 9 PM. For conservatism of traffic noise analysis, outbound materials were assumed to be transported from the proposed Project by trailers and trucks which enter the site empty and exit the site full. However, it is expected that the majority of outbound transportation of materials from the site will be done via rail, which would reduce the number of truck trips generated by the Project.

## 8.2 Truck Activity Modeling Methodology and Criteria

The noise impacts associated with on-site truck activity of the proposed Project were predicted using the Federal Highway Administration (FHWA) Traffic Noise Model (TNM), Version 2.5. TNM is the required software calculation and noise evaluation tool for projects receiving funding from FHWA or the Massachusetts Department of Transportation (MassDOT). Although this project is not required to comply with FHWA or MassDOT noise limits, for comparative purposes, on-site trucking activity has been evaluated against both the FHWA residential noise abatement criterion of 66 dBA[3] (absolute limit) and the MassDOT significance threshold of an increase over existing sound levels of 10 dBA or more[4].

The peak traffic hour (worst-case) of proposed on-site trucking activity was compared to the existing peak traffic hour sound level due to current trucking activity at the Project Site. The existing and future truck traffic volumes were based upon previous site traffic studies[5], which resulted in 48 peak total truck trips per hour (future) compared to 27 peak total truck trips per hour (existing). The existing trucking activity on the site includes Eversource vehicles, which operate 24 hours per day, as well as NWD Trucking, and glass trips.

According to the FHWA, a traffic noise impact occurs when the hourly A-weighted $L_{eq}$ sound level approaches or exceeds the noise abatement criteria (NAC) level. The NAC is dependent upon the land use of the area being evaluated. For this evaluation, sound levels from trucking activity was predicted at the same four residential receptors analyzed for

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[3] Federal Highway Administration (FHWA) Code of Federal Regulations 23 CFR 772. https://www.fhwa.dot.gov/environMent/noise/regulations_and_guidance/polguide/polguide03.cfm, accessed August 2019.

[4] MassDOT, Type I and Type II Noise Abatement Policy.

[5] August 14, 2019 Traffic Study from Draft Environmental Impact Report, and July 2018 Traffic Impact Study submitted with the Project's Expanded Environmental Notification Form.

stationary sound sources, and therefore were compared to 66 dBA (within 1 dBA of the 67 dBA criterion). FHWA NAC levels for various activity categories are presented in Table 8-1.

**Table 8-1 Noise Abatement Criteria Hourly A-Weighted Sound Level in Decibels (dBA)**

| Activity Category | $L_{eq}$ (h) | Description of Activity Category |
|---|---|---|
| A | 57 (Exterior) | Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. |
| B | 67 (Exterior) | Picnic areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals. |
| C | 72 (Exterior) | Developed lands, properties, or activities not included in Categories A or B above. |

## 8.3 On-Site Truck Traffic Modeling Results

Table 8-2 below presents a comparison of the predicted on-site truck sound levels to the FHWA NAC and the MassDOT significance increase threshold. All predicted sound levels are below the 66 dBA FHWA criteria for residences at the four residential receptors. Incremental increases at all receptors are all below the MassDOT 10-dBA significance threshold.

**Table 8-2 Predicted Existing and Future Truck Traffic Sound Levels at Residential Receptors**

| Modeling Location ID | Existing Peak-Hour Sound Level (dBA) | Future Peak-Hour Sound Level (dBA) | Incremental Increase Over Existing (dBA) | FHWA Residential Noise Abatement Criterion (dBA) |
|---|---|---|---|---|
| RES-1 | 46 | 48 | 2 | 66 |
| RES-2 | 49 | 52 | 3 | 66 |
| RES-3 | 50 | 52 | 2 | 66 |
| RES-4 | 49 | 52 | 3 | 66 |

# 9.0 CONCLUSIONS

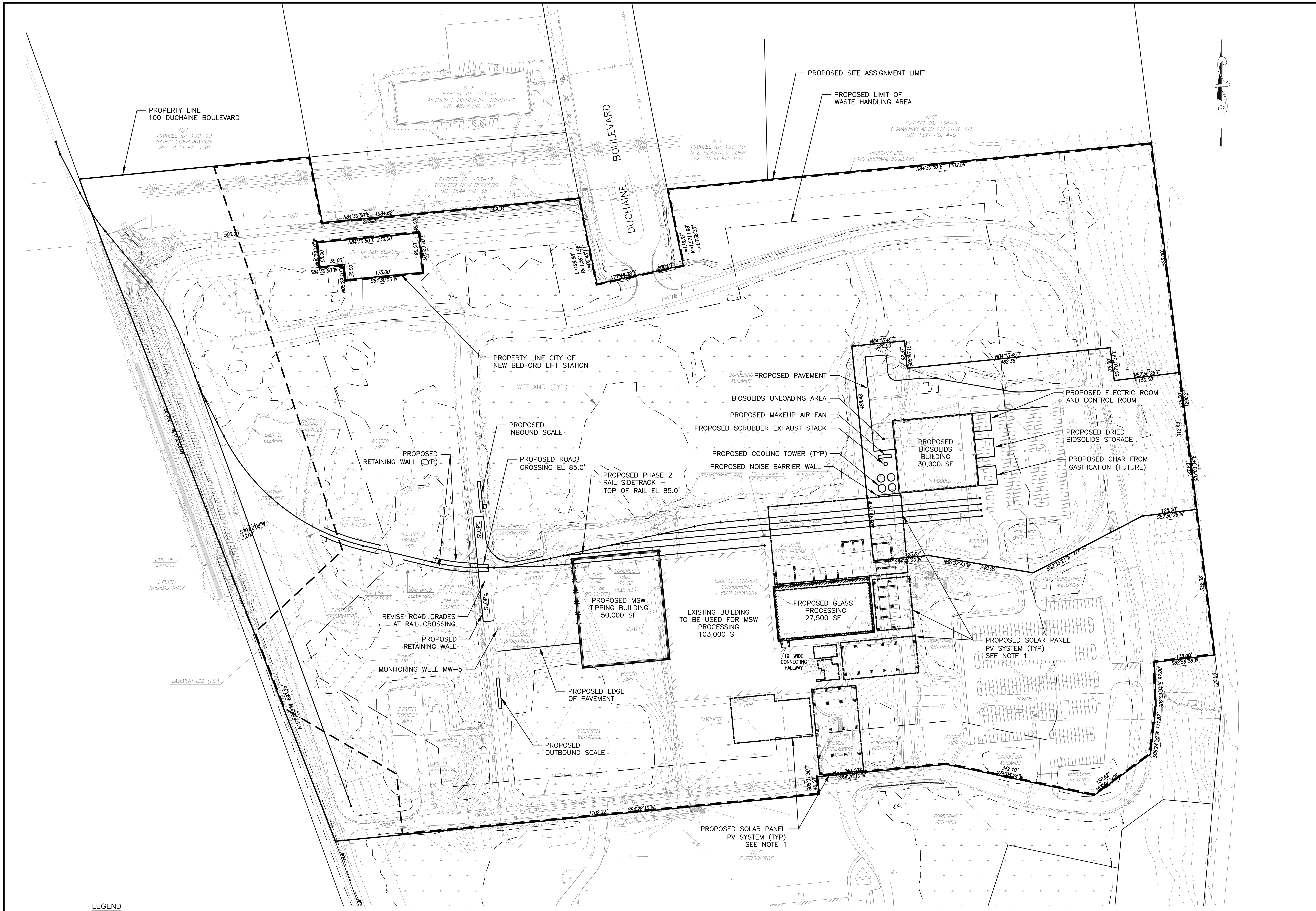
A comprehensive sound level modeling assessment was conducted for the Parallel Products of New England Project. In addition, ambient sound levels were measured to characterize the existing background sound levels within the area. Results of a complete sound level assessment demonstrate that sound levels from the Project with the sound mitigation measures described in this report will meet the requirements set forth in the MassDEP Noise Policy at residential locations.

Sound pressure levels due to the operation of all equipment operating simultaneously at full load were modeled at the four residential sound level modeling locations. This is a conservative modeling assumption which will result in higher predicted sound levels relative to various actual part-load and intermittent operation of some of the sources.

Traffic noise modeling of existing and proposed future on-site trucking activity was conducted and compared to FHWA and MassDOT criteria. Resulting sound levels at all residential receptors were predicted to be below these criteria.

# Appendix A

## Parallel Products Site Plan




## LEGEND

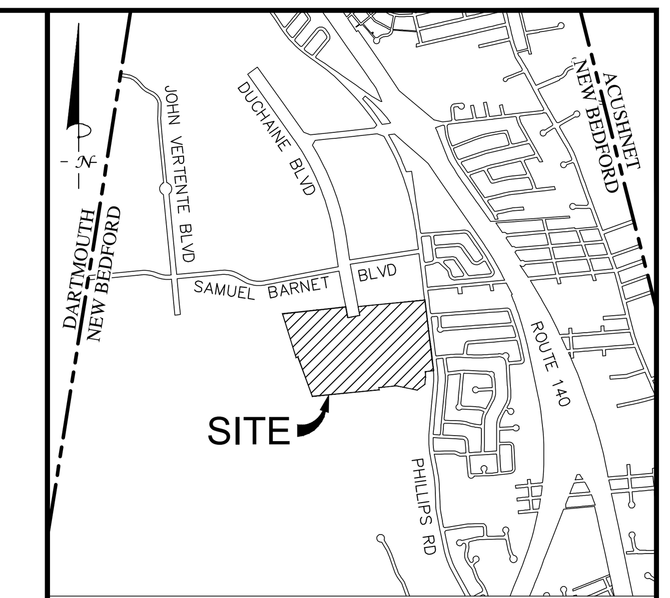
- EXISTING FEATURES
- PROPOSED FEATURES
- SITE ASSIGNMENT LIMIT
- LIMIT OF WASTE HANDLING AREA

100' 0 100' 200'

BAR SCALE
1" = 100'

NOTES:

1. ONLY THE OUTLINE OF THE PROPOSED SOLAR PANEL PV SYSTEM IS SHOWN FOR CLARITY. THE PROPOSED SOLAR PANELS ARE TO BE LOCATED ON AN ELEVATED CANOPY ABOVE EXISTING AND PROPOSED SITE FEATURES.




LOCUS MAP NOT TO SCALE


Green Seal Environmental, Inc.
114 State Road, Building B
Sagamore Beach, MA 02562
Tel: (508) 888-6034
Fax: (508) 888-1506
www.gseenv.com




REVISIONS

| NO. | DATE | COMMENT |
| --- | --- | --- |
| A | 2/4/2019 | ISSUED FOR PERMITTING |

PURPOSE:

PERMITTING

LOCUS:

100 DUCHAINE BOULEVARD
NEW BEDFORD,
MASSACHUSETTS

PREPARED FOR:

PARALLEL PRODUCTS, LLC

DRAWING TITLE:

PHASE 2 SITE PLAN

| CAD TECH: | CHECKED BY: |
| --- | --- |
| T. JANICKI | |
| ENGINEER: | DATE: |
| W. HALL | 2/1/2019 |
| | SCALE: |
| | 1"=100' |
| | SHEET: |
| | C2A |

# Appendix B

# Continuous (Long-Term) Sound Level Measurement Data

Table B1

| | Background Sound Levels (dBA) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | CM1 | | | | CM2 | | | |
| Date/Time | $L_{eq}$ | $L_{90}$ | ANS $L_{eq}$ | ANS $L_{90}$ | $L_{eq}$ | $L_{90}$ | ANS $L_{eq}$ | ANS $L_{90}$ |
| 6/26/2018 0:00 | | | | | | | | |
| 6/26/2018 1:00 | | | | | | | | |
| 6/26/2018 2:00 | | | | | | | | |
| 6/26/2018 3:00 | | | | | | | | |
| 6/26/2018 4:00 | | | | | | | | |
| 6/26/2018 5:00 | | | | | | | | |
| 6/26/2018 6:00 | | | | | | | | |
| 6/26/2018 7:00 | | | | | | | | |
| 6/26/2018 8:00 | | | | | | | | |
| 6/26/2018 9:00 | | | | | | | | |
| 6/26/2018 10:00 | | | | | | | | |
| 6/26/2018 11:00 | | | | | | | | |
| 6/26/2018 12:00 | | | | | | | | |
| 6/26/2018 13:00 | | | | | | | | |
| 6/26/2018 14:00 | 57 | 49 | 55 | 47 | 46 | 40 | 45 | 40 |
| 6/26/2018 15:00 | 58 | 50 | 57 | 48 | 47 | 41 | 46 | 40 |
| 6/26/2018 16:00 | 56 | 49 | 55 | 47 | 48 | 42 | 47 | 41 |
| 6/26/2018 17:00 | 57 | 47 | 55 | 46 | 49 | 40 | 48 | 39 |
| 6/26/2018 18:00 | 55 | 46 | 53 | 45 | 53 | 39 | 52 | 38 |
| 6/26/2018 19:00 | 53 | 44 | 51 | 44 | 42 | 38 | 41 | 38 |
| 6/26/2018 20:00 | 54 | 44 | 52 | 43 | 40 | 38 | 39 | 37 |
| 6/26/2018 21:00 | 52 | 40 | 51 | 39 | 39 | 37 | 38 | 37 |
| 6/26/2018 22:00 | 46 | 40 | 45 | 40 | 39 | 37 | 39 | 37 |
| 6/26/2018 23:00 | 48 | 37 | 47 | 37 | 38 | 37 | 38 | 36 |
| 6/27/2018 0:00 | 43 | 35 | 42 | 35 | 39 | 37 | 38 | 36 |
| 6/27/2018 1:00 | 40 | 36 | 39 | 35 | 39 | 38 | 39 | 37 |
| 6/27/2018 2:00 | 39 | 36 | 39 | 36 | 39 | 38 | 39 | 37 |
| 6/27/2018 3:00 | 41 | 37 | 40 | 36 | 39 | 37 | 39 | 37 |
| 6/27/2018 4:00 | 46 | 40 | 44 | 39 | 40 | 38 | 39 | 38 |
| 6/27/2018 5:00 | 54 | 42 | 52 | 41 | 44 | 39 | 43 | 39 |
| 6/27/2018 6:00 | 55 | 45 | 53 | 44 | 48 | 40 | 45 | 40 |
| 6/27/2018 7:00 | 63 | 48 | 61 | 47 | 53 | 40 | 53 | 40 |
| 6/27/2018 8:00 | 58 | 46 | 56 | 44 | 45 | 43 | 44 | 42 |
| 6/27/2018 9:00 | 56 | 46 | 55 | 45 | 44 | 42 | 44 | 42 |
| 6/27/2018 10:00 | 57 | 46 | 55 | 45 | 45 | 43 | 44 | 42 |
| 6/27/2018 11:00 | 55 | 47 | 54 | 45 | 49 | 42 | 49 | 42 |
| 6/27/2018 12:00 | 55 | 45 | 53 | 44 | 44 | 42 | 43 | 42 |
| 6/27/2018 13:00 | 56 | 48 | 55 | 47 | 47 | 42 | 46 | 41 |
| 6/27/2018 14:00 | 54 | 48 | 53 | 47 | 44 | 41 | 43 | 40 |
| 6/27/2018 15:00 | 59 | 49 | 57 | 48 | 46 | 40 | 45 | 39 |
| 6/27/2018 16:00 | 57 | 48 | 56 | 46 | 46 | 38 | 45 | 38 |

| | Background Sound Levels (dBA) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | CM1 | | | | CM2 | | | |
| Date/Time | $L_{eq}$ | $L_{90}$ | ANS $L_{eq}$ | ANS $L_{90}$ | $L_{eq}$ | $L_{90}$ | ANS $L_{eq}$ | ANS $L_{90}$ |
| 6/27/2018 17:00 | 58 | 47 | 57 | 46 | 39 | 37 | 39 | 37 |
| 6/27/2018 18:00 | 55 | 45 | 54 | 45 | 40 | 38 | 39 | 37 |
| 6/27/2018 19:00 | 52 | 44 | 51 | 43 | 42 | 37 | 41 | 36 |
| 6/27/2018 20:00 | 54 | 44 | 53 | 44 | 39 | 37 | 38 | 37 |
| 6/27/2018 21:00 | 56 | 44 | 55 | 43 | 41 | 38 | 40 | 37 |
| 6/27/2018 22:00 | 51 | 40 | 50 | 39 | 40 | 37 | 39 | 36 |
| 6/27/2018 23:00 | 50 | 39 | 48 | 38 | 38 | 36 | 37 | 35 |
| 6/28/2018 0:00 | 45 | 37 | 43 | 36 | 37 | 35 | 36 | 34 |
| 6/28/2018 1:00 | 41 | 37 | 40 | 35 | 37 | 35 | 36 | 34 |
| 6/28/2018 2:00 | 40 | 36 | 38 | 34 | 38 | 36 | 37 | 34 |
| 6/28/2018 3:00 | 43 | 38 | 41 | 36 | 39 | 36 | 37 | 35 |
| 6/28/2018 4:00 | 47 | 41 | 45 | 40 | 41 | 38 | 39 | 37 |
| 6/28/2018 5:00 | 50 | 44 | 47 | 43 | 42 | 39 | 40 | 38 |
| 6/28/2018 6:00 | 54 | 46 | 53 | 45 | 46 | 41 | 44 | 40 |
| 6/28/2018 7:00 | 60 | 51 | 58 | 49 | 47 | 43 | 46 | 43 |
| 6/28/2018 8:00 | 56 | 50 | 55 | 49 | 46 | 43 | 44 | 42 |
| 6/28/2018 9:00 | 56 | 49 | 54 | 47 | 50 | 42 | 45 | 41 |
| 6/28/2018 10:00 | 58 | 48 | 56 | 46 | 45 | 40 | 42 | 39 |
| 6/28/2018 11:00 | 57 | 47 | 55 | 45 | 44 | 40 | 42 | 39 |
| 6/28/2018 12:00 | 59 | 49 | 58 | 47 | 44 | 40 | 42 | 40 |
| 6/28/2018 13:00 | 58 | 49 | 56 | 47 | 49 | 42 | 44 | 41 |
| 6/28/2018 14:00 | 61 | 53 | 56 | 50 | 60 | 49 | 53 | 44 |
| 6/28/2018 15:00 | 63 | 52 | 59 | 49 | 58 | 49 | 51 | 44 |
| 6/28/2018 16:00 | 60 | 52 | 55 | 49 | 58 | 48 | 51 | 43 |
| 6/28/2018 17:00 | 58 | 49 | 56 | 46 | 51 | 44 | 46 | 41 |
| 6/28/2018 18:00 | 59 | 47 | 58 | 45 | 46 | 41 | 44 | 37 |
| 6/28/2018 19:00 | 55 | 44 | 53 | 42 | 41 | 38 | 39 | 36 |
| 6/28/2018 20:00 | 51 | 42 | 49 | 40 | 40 | 36 | 36 | 34 |
| 6/28/2018 21:00 | 56 | 41 | 55 | 40 | 38 | 35 | 36 | 33 |
| 6/28/2018 22:00 | 52 | 39 | 51 | 37 | 38 | 36 | 37 | 34 |
| 6/28/2018 23:00 | 49 | 37 | 48 | 34 | 36 | 34 | 34 | 32 |
| 6/29/2018 0:00 | 44 | 38 | 42 | 36 | 36 | 34 | 35 | 31 |
| 6/29/2018 1:00 | 45 | 40 | 44 | 39 | 39 | 37 | 38 | 36 |
| 6/29/2018 2:00 | 44 | 43 | 44 | 43 | 39 | 38 | 38 | 37 |
| 6/29/2018 3:00 | 44 | 41 | 43 | 40 | 39 | 38 | 38 | 37 |
| 6/29/2018 4:00 | 51 | 42 | 49 | 41 | 41 | 39 | 40 | 38 |
| 6/29/2018 5:00 | 57 | 43 | 55 | 42 | 44 | 41 | 42 | 41 |
| 6/29/2018 6:00 | 54 | 45 | 53 | 44 | 46 | 42 | 44 | 41 |
| 6/29/2018 7:00 | 60 | 47 | 59 | 46 | 45 | 42 | 44 | 41 |
| 6/29/2018 8:00 | 60 | 48 | 58 | 46 | 44 | 41 | 43 | 41 |
| 6/29/2018 9:00 | 56 | 48 | 55 | 46 | 44 | 40 | 44 | 40 |
| 6/29/2018 10:00 | 57 | 47 | 55 | 45 | 47 | 40 | 43 | 39 |
| 6/29/2018 11:00 | 56 | 46 | 55 | 45 | 42 | 38 | 42 | 38 |

| | Background Sound Levels (dBA) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | CM1 | | | | CM2 | | | |
| Date/Time | $L_{eq}$ | $L_{90}$ | ANS $L_{eq}$ | ANS $L_{90}$ | $L_{eq}$ | $L_{90}$ | ANS $L_{eq}$ | ANS $L_{90}$ |
| 6/29/2018 12:00 | 59 | 47 | 57 | 45 | 47 | 40 | 46 | 39 |
| 6/29/2018 13:00 | 58 | 50 | 56 | 48 | 47 | 38 | 46 | 38 |
| 6/29/2018 14:00 | 57 | 51 | 56 | 49 | 46 | 41 | 45 | 40 |
| 6/29/2018 15:00 | 58 | 49 | 56 | 48 | 50 | 39 | 49 | 38 |
| 6/29/2018 16:00 | 55 | 46 | 53 | 45 | 47 | 37 | 47 | 37 |
| 6/29/2018 17:00 | 55 | 46 | 54 | 45 | 42 | 37 | 42 | 37 |
| 6/29/2018 18:00 | 52 | 45 | 51 | 44 | 42 | 38 | 42 | 37 |
| 6/29/2018 19:00 | 56 | 45 | 55 | 45 | 42 | 40 | 41 | 39 |
| 6/29/2018 20:00 | 52 | 46 | 52 | 46 | 45 | 43 | 43 | 42 |
| 6/29/2018 21:00 | 59 | 47 | 58 | 46 | 45 | 43 | 44 | 43 |
| 6/29/2018 22:00 | 55 | 48 | 54 | 48 | 45 | 43 | 45 | 43 |
| 6/29/2018 23:00 | 53 | 45 | 52 | 45 | 45 | 43 | 45 | 43 |
| 6/30/2018 0:00 | 51 | 44 | 50 | 43 | 43 | 42 | 43 | 41 |
| 6/30/2018 1:00 | 56 | 44 | 54 | 44 | 42 | 41 | 42 | 40 |
| 6/30/2018 2:00 | 59 | 45 | 58 | 45 | 42 | 40 | 42 | 40 |
| 6/30/2018 3:00 | 53 | 42 | 51 | 41 | 41 | 38 | 40 | 38 |
| 6/30/2018 4:00 | 55 | 43 | 54 | 42 | 43 | 40 | 42 | 39 |
| 6/30/2018 5:00 | 57 | 44 | 56 | 43 | 45 | 41 | 43 | 41 |
| 6/30/2018 6:00 | 52 | 45 | 51 | 44 | 46 | 42 | 45 | 42 |
| 6/30/2018 7:00 | 57 | 42 | 55 | 42 | 46 | 40 | 42 | 39 |
| 6/30/2018 8:00 | 55 | 41 | 54 | 40 | 49 | 37 | 48 | 36 |
| 6/30/2018 9:00 | 55 | 43 | 54 | 42 | 49 | 36 | 48 | 35 |
| 6/30/2018 10:00 | 52 | 44 | 51 | 43 | 43 | 35 | 42 | 34 |
| 6/30/2018 11:00 | 52 | 43 | 51 | 42 | 47 | 36 | 46 | 35 |
| 6/30/2018 12:00 | 57 | 42 | 56 | 41 | 40 | 34 | 39 | 32 |
| 6/30/2018 13:00 | 53 | 42 | 52 | 41 | 40 | 33 | 38 | 32 |
| 6/30/2018 14:00 | 50 | 41 | 49 | 40 | 37 | 33 | 36 | 32 |
| 6/30/2018 15:00 | 50 | 42 | 48 | 41 | 39 | 34 | 38 | 33 |
| 6/30/2018 16:00 | 47 | 41 | 46 | 40 | 40 | 32 | 39 | 31 |
| 6/30/2018 17:00 | 49 | 41 | 48 | 40 | 37 | 33 | 36 | 31 |
| 6/30/2018 18:00 | 53 | 40 | 51 | 40 | 39 | 34 | 38 | 33 |
| 6/30/2018 19:00 | 46 | 40 | 45 | 39 | 37 | 34 | 36 | 33 |
| 6/30/2018 20:00 | 48 | 40 | 47 | 40 | 39 | 35 | 38 | 35 |
| 6/30/2018 21:00 | 47 | 40 | 46 | 40 | 45 | 36 | 45 | 36 |
| 6/30/2018 22:00 | 44 | 40 | 44 | 39 | 38 | 35 | 38 | 35 |
| 6/30/2018 23:00 | 45 | 40 | 44 | 39 | 39 | 36 | 39 | 35 |
| 7/1/2018 0:00 | 43 | 38 | 42 | 37 | 41 | 39 | 41 | 39 |
| 7/1/2018 1:00 | 41 | 37 | 41 | 36 | 41 | 39 | 41 | 39 |
| 7/1/2018 2:00 | 41 | 37 | 40 | 36 | 40 | 38 | 40 | 38 |
| 7/1/2018 3:00 | 41 | 37 | 41 | 37 | 39 | 37 | 39 | 37 |
| 7/1/2018 4:00 | 41 | 37 | 39 | 36 | 41 | 37 | 39 | 37 |
| 7/1/2018 5:00 | 43 | 39 | 41 | 39 | 43 | 39 | 41 | 39 |
| 7/1/2018 6:00 | 46 | 39 | 45 | 38 | 43 | 40 | 41 | 39 |

| | Background Sound Levels (dBA) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | CM1 | | | | CM2 | | | |
| Date/Time | $L_{eq}$ | $L_{90}$ | ANS $L_{eq}$ | ANS $L_{90}$ | $L_{eq}$ | $L_{90}$ | ANS $L_{eq}$ | ANS $L_{90}$ |
| 7/1/2018 7:00 | 47 | 42 | 46 | 42 | 39 | 36 | 38 | 36 |
| 7/1/2018 8:00 | 55 | 42 | 54 | 41 | 44 | 35 | 39 | 34 |
| 7/1/2018 9:00 | 46 | 38 | 45 | 37 | 42 | 36 | 41 | 35 |
| 7/1/2018 10:00 | 51 | 41 | 49 | 40 | 39 | 36 | 38 | 35 |
| 7/1/2018 11:00 | 49 | 40 | 47 | 38 | 41 | 34 | 38 | 33 |
| 7/1/2018 12:00 | 51 | 42 | 49 | 41 | 42 | 35 | 38 | 35 |
| 7/1/2018 13:00 | 51 | 43 | 50 | 42 | 43 | 35 | 38 | 34 |
| 7/1/2018 14:00 | 57 | 42 | 56 | 41 | 38 | 34 | 38 | 33 |
| 7/1/2018 15:00 | 53 | 41 | 52 | 41 | 38 | 34 | 37 | 33 |
| 7/1/2018 16:00 | 53 | 43 | 52 | 42 | 39 | 35 | 38 | 34 |
| 7/1/2018 17:00 | 52 | 40 | 51 | 39 | 38 | 35 | 38 | 34 |
| 7/1/2018 18:00 | 49 | 39 | 48 | 38 | 38 | 35 | 37 | 34 |
| 7/1/2018 19:00 | 50 | 38 | 48 | 37 | 40 | 35 | 39 | 34 |
| 7/1/2018 20:00 | 50 | 39 | 49 | 38 | 40 | 36 | 38 | 35 |
| 7/1/2018 21:00 | 45 | 38 | 44 | 37 | 40 | 37 | 39 | 37 |
| 7/1/2018 22:00 | 44 | 36 | 43 | 35 | 39 | 36 | 39 | 35 |
| 7/1/2018 23:00 | 43 | 35 | 42 | 34 | 39 | 36 | 39 | 35 |
| 7/2/2018 0:00 | 38 | 32 | 37 | 31 | 38 | 35 | 38 | 35 |
| 7/2/2018 1:00 | 40 | 32 | 39 | 31 | 36 | 33 | 36 | 32 |
| 7/2/2018 2:00 | 37 | 31 | 36 | 30 | 34 | 33 | 34 | 32 |
| 7/2/2018 3:00 | 40 | 32 | 39 | 32 | 36 | 34 | 36 | 33 |
| 7/2/2018 4:00 | 46 | 36 | 43 | 35 | 41 | 37 | 39 | 37 |
| 7/2/2018 5:00 | 52 | 41 | 51 | 41 | 43 | 41 | 42 | 40 |
| 7/2/2018 6:00 | 52 | 43 | 51 | 41 | 45 | 41 | 44 | 41 |
| 7/2/2018 7:00 | 60 | 46 | 58 | 45 | 46 | 40 | 44 | 40 |
| 7/2/2018 8:00 | 58 | 49 | 57 | 47 | 43 | 38 | 41 | 37 |
| 7/2/2018 9:00 | 58 | 49 | 57 | 47 | 43 | 37 | 42 | 36 |
| 7/2/2018 10:00 | 57 | 50 | 55 | 47 | 42 | 36 | 41 | 35 |
| 7/2/2018 11:00 | 56 | 47 | 55 | 46 | 44 | 36 | 41 | 35 |
| 7/2/2018 12:00 | 56 | 47 | 54 | 45 | 44 | 37 | 42 | 36 |
| 7/2/2018 13:00 | 56 | 44 | 55 | 43 | 39 | 37 | 38 | 36 |
| 7/2/2018 14:00 | 56 | 45 | 55 | 44 | 49 | 37 | 48 | 37 |
| 7/2/2018 15:00 | 57 | 47 | 56 | 46 | 53 | 38 | 52 | 38 |
| 7/2/2018 16:00 | 55 | 47 | 53 | 46 | 48 | 40 | 46 | 39 |
| 7/2/2018 17:00 | 57 | 47 | 56 | 46 | 48 | 38 | 46 | 38 |
| 7/2/2018 18:00 | 56 | 45 | 55 | 44 | 46 | 36 | 45 | 36 |
| 7/2/2018 19:00 | 54 | 44 | 53 | 43 | 38 | 36 | 37 | 35 |
| 7/2/2018 20:00 | 51 | 42 | 50 | 42 | 42 | 36 | 41 | 36 |
| 7/2/2018 21:00 | 52 | 51 | 50 | 49 | 37 | 34 | 37 | 34 |
| 7/2/2018 22:00 | 56 | 42 | 55 | 41 | 37 | 34 | 36 | 33 |
| 7/2/2018 23:00 | 50 | 37 | 48 | 37 | 36 | 34 | 36 | 33 |
| 7/3/2018 0:00 | 42 | 34 | 41 | 33 | 34 | 32 | 34 | 31 |
| 7/3/2018 1:00 | 53 | 33 | 53 | 32 | 34 | 31 | 34 | 30 |

| | Background Sound Levels (dBA) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | CM1 | | | | CM2 | | | |
| Date/Time | $L_{eq}$ | $L_{90}$ | ANS $L_{eq}$ | ANS $L_{90}$ | $L_{eq}$ | $L_{90}$ | ANS $L_{eq}$ | ANS $L_{90}$ |
| 7/3/2018 2:00 | 38 | 31 | 37 | 29 | 32 | 29 | 32 | 28 |
| 7/3/2018 3:00 | 40 | 29 | 39 | 28 | 34 | 30 | 34 | 28 |
| 7/3/2018 4:00 | 47 | 34 | 45 | 33 | 39 | 33 | 35 | 31 |
| 7/3/2018 5:00 | 52 | 39 | 49 | 38 | 42 | 35 | 34 | 33 |
| 7/3/2018 6:00 | 52 | 42 | 51 | 40 | 45 | 36 | 43 | 34 |
| 7/3/2018 7:00 | 63 | 49 | 61 | 47 | 42 | 37 | 41 | 36 |
| 7/3/2018 8:00 | 61 | 53 | 59 | 50 | 40 | 37 | 39 | 36 |
| 7/3/2018 9:00 | 60 | 50 | 59 | 48 | 45 | 38 | 44 | 38 |
| 7/3/2018 10:00 | 61 | 50 | 59 | 49 | 43 | 39 | 42 | 38 |
| 7/3/2018 11:00 | 58 | 47 | 56 | 46 | 42 | 39 | 41 | 39 |
| 7/3/2018 12:00 | 57 | 46 | 55 | 45 | 57 | 39 | 41 | 38 |
| 7/3/2018 13:00 | 55 | 47 | 54 | 46 | 43 | 39 | 42 | 38 |
| 7/3/2018 14:00 | 54 | 46 | 53 | 45 | | | | |
| 7/3/2018 15:00 | | | | | | | | |
| 7/3/2018 16:00 | | | | | | | | |
| 7/3/2018 17:00 | | | | | | | | |
| 7/3/2018 18:00 | | | | | | | | |
| 7/3/2018 19:00 | | | | | | | | |
| 7/3/2018 20:00 | | | | | | | | |
| 7/3/2018 21:00 | | | | | | | | |
| 7/3/2018 22:00 | | | | | | | | |
| 7/3/2018 23:00 | | | | | | | | |
| 7/4/2018 0:00 | | | | | | | | |

# Appendix C

## Meteorological Data: NWS Station – New Bedford Regional Airport, MA

Table C1

STATION: KEWB
STATION NAME: New Bedford
LATITUDE: 41.67528
LONGITUDE: -70.95694
ELEVATION [ft]: 79
STATE: MA

| Date/Time | Air Temp (F) | RH (%) | Precip One-Hour (in) |
|---|---|---|---|
| | | | |
| 06/26/2018 07:00 EDT | 60.8 | 93.8 | |
| 06/26/2018 07:05 EDT | 60.8 | 100 | |
| 06/26/2018 07:10 EDT | 62.6 | 93.84 | |
| 06/26/2018 07:15 EDT | 62.6 | 88.02 | |
| 06/26/2018 07:20 EDT | 62.6 | 88.02 | |
| 06/26/2018 07:25 EDT | 62.6 | 93.84 | |
| 06/26/2018 07:30 EDT | 62.6 | 88.02 | |
| 06/26/2018 07:35 EDT | 64.4 | 88.11 | |
| 06/26/2018 07:40 EDT | 64.4 | 82.65 | |
| 06/26/2018 07:45 EDT | 64.4 | 77.48 | |
| 06/26/2018 07:50 EDT | 64.4 | 77.48 | |
| 06/26/2018 07:53 EDT | 64.94 | 78.03 | |
| 06/26/2018 07:55 EDT | 64.4 | 77.48 | |
| 06/26/2018 08:00 EDT | 64.4 | 77.48 | |
| 06/26/2018 08:05 EDT | 64.4 | 77.48 | |
| 06/26/2018 08:10 EDT | 66.2 | 72.78 | |
| 06/26/2018 08:15 EDT | 66.2 | 72.78 | |
| 06/26/2018 08:20 EDT | 66.2 | 68.2 | |
| 06/26/2018 08:25 EDT | 66.2 | 68.2 | |
| 06/26/2018 08:30 EDT | 68 | 68.41 | |
| 06/26/2018 08:35 EDT | 68 | 64.1 | |
| 06/26/2018 08:40 EDT | 68 | 64.1 | |
| 06/26/2018 08:45 EDT | 68 | 64.1 | |
| 06/26/2018 08:50 EDT | 68 | 64.1 | |
| 06/26/2018 08:53 EDT | 68 | 60.82 | |
| 06/26/2018 08:55 EDT | 69.8 | 56.44 | |
| 06/26/2018 09:00 EDT | 69.8 | 52.83 | |
| 06/26/2018 09:05 EDT | 69.8 | 56.44 | |
| 06/26/2018 09:10 EDT | 69.8 | 52.83 | |
| 06/26/2018 09:15 EDT | 69.8 | 52.83 | |
| 06/26/2018 09:20 EDT | 69.8 | 52.83 | |
| 06/26/2018 09:25 EDT | 69.8 | 52.83 | |
| 06/26/2018 09:30 EDT | 71.6 | 49.7 | |
| 06/26/2018 09:35 EDT | 71.6 | 49.7 | |
| 06/26/2018 09:40 EDT | 71.6 | 46.5 | |
| 06/26/2018 09:45 EDT | 71.6 | 49.7 | |

| | | | |
|---|---|---|---|
| 06/26/2018 09:50 EDT | 71.6 | 46.5 | |
| 06/26/2018 09:53 EDT | 71.06 | 47.36 | |
| 06/26/2018 09:55 EDT | 71.6 | 46.5 | |
| 06/26/2018 10:00 EDT | 71.6 | 49.7 | |
| 06/26/2018 10:05 EDT | 71.6 | 46.5 | |
| 06/26/2018 10:10 EDT | 71.6 | 46.5 | |
| 06/26/2018 10:15 EDT | 73.4 | 43.76 | |
| 06/26/2018 10:20 EDT | 73.4 | 40.92 | |
| 06/26/2018 10:25 EDT | 71.6 | 43.48 | |
| 06/26/2018 10:30 EDT | 73.4 | 40.92 | |
| 06/26/2018 10:35 EDT | 73.4 | 40.92 | |
| 06/26/2018 10:40 EDT | 73.4 | 40.92 | |
| 06/26/2018 10:45 EDT | 73.4 | 40.92 | |
| 06/26/2018 10:50 EDT | 73.4 | 40.92 | |
| 06/26/2018 10:53 EDT | 73.04 | 41.14 | |
| 06/26/2018 10:55 EDT | 73.4 | 38.24 | |
| 06/26/2018 11:00 EDT | 73.4 | 40.92 | |
| 06/26/2018 11:05 EDT | 73.4 | 38.24 | |
| 06/26/2018 11:10 EDT | 73.4 | 38.24 | |
| 06/26/2018 11:15 EDT | 73.4 | 38.24 | |
| 06/26/2018 11:20 EDT | 75.2 | 36.01 | |
| 06/26/2018 11:25 EDT | 75.2 | 36.01 | |
| 06/26/2018 11:30 EDT | 77 | 33.92 | |
| 06/26/2018 11:35 EDT | 75.2 | 33.63 | |
| 06/26/2018 11:40 EDT | 75.2 | 33.63 | |
| 06/26/2018 11:45 EDT | 75.2 | 33.63 | |
| 06/26/2018 11:50 EDT | 75.2 | 33.63 | |
| 06/26/2018 11:53 EDT | 73.94 | 34.36 | |
| 06/26/2018 11:55 EDT | 73.4 | 35.72 | |
| 06/26/2018 12:00 EDT | 73.4 | 35.72 | |
| 06/26/2018 12:05 EDT | 75.2 | 36.01 | |
| 06/26/2018 12:10 EDT | 75.2 | 36.01 | |
| 06/26/2018 12:15 EDT | 75.2 | 36.01 | |
| 06/26/2018 12:20 EDT | 75.2 | 33.63 | |
| 06/26/2018 12:25 EDT | 75.2 | 33.63 | |
| 06/26/2018 12:30 EDT | 75.2 | 36.01 | |
| 06/26/2018 12:35 EDT | 75.2 | 33.63 | |
| 06/26/2018 12:40 EDT | 75.2 | 33.63 | |
| 06/26/2018 12:45 EDT | 75.2 | 33.63 | |
| 06/26/2018 12:50 EDT | 75.2 | 31.39 | |
| 06/26/2018 12:53 EDT | 75.92 | 32.17 | |
| 06/26/2018 12:55 EDT | 75.2 | 33.63 | |
| 06/26/2018 13:00 EDT | 77 | 31.68 | |
| 06/26/2018 13:05 EDT | 77 | 31.68 | |
| 06/26/2018 13:10 EDT | 77 | 31.68 | |
| 06/26/2018 13:15 EDT | 77 | 31.68 | |
| 06/26/2018 13:20 EDT | 77 | 31.68 | |

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|---|---|---|---|
| 06/26/2018 13:25 EDT | 75.2 | 33.63 | |
| 06/26/2018 13:30 EDT | 78.8 | 31.97 | |
| 06/26/2018 13:35 EDT | 75.2 | 33.63 | |
| 06/26/2018 13:40 EDT | 77 | 31.68 | |
| 06/26/2018 13:45 EDT | 77 | 31.68 | |
| 06/26/2018 13:50 EDT | 77 | 31.68 | |
| 06/26/2018 13:53 EDT | 77 | 33.46 | |
| 06/26/2018 13:55 EDT | 77 | 36.3 | |
| 06/26/2018 14:05 EDT | 77 | 36.3 | |
| 06/26/2018 15:00 EDT | 75.2 | 38.53 | |
| 06/26/2018 15:05 EDT | 75.2 | 38.53 | |
| 06/26/2018 15:10 EDT | 75.2 | 38.53 | |
| 06/26/2018 15:15 EDT | 75.2 | 38.53 | |
| 06/26/2018 15:20 EDT | 75.2 | 36.01 | |
| 06/26/2018 15:25 EDT | 75.2 | 38.53 | |
| 06/26/2018 15:30 EDT | 75.2 | 38.53 | |
| 06/26/2018 15:35 EDT | 75.2 | 36.01 | |
| 06/26/2018 15:40 EDT | 75.2 | 36.01 | |
| 06/26/2018 15:45 EDT | 75.2 | 36.01 | |
| 06/26/2018 15:50 EDT | 75.2 | 36.01 | |
| 06/26/2018 15:53 EDT | 75.02 | 34.3 | |
| 06/26/2018 15:55 EDT | 75.2 | 33.63 | |
| 06/26/2018 16:00 EDT | 73.4 | 35.72 | |
| 06/26/2018 16:05 EDT | 75.2 | 33.63 | |
| 06/26/2018 16:10 EDT | 75.2 | 33.63 | |
| 06/26/2018 16:15 EDT | 75.2 | 33.63 | |
| 06/26/2018 16:20 EDT | 75.2 | 36.01 | |
| 06/26/2018 16:25 EDT | 75.2 | 36.01 | |
| 06/26/2018 16:30 EDT | 73.4 | 38.24 | |
| 06/26/2018 16:35 EDT | 73.4 | 35.72 | |
| 06/26/2018 16:40 EDT | 73.4 | 33.34 | |
| 06/26/2018 16:45 EDT | 73.4 | 33.34 | |
| 06/26/2018 16:50 EDT | 73.4 | 33.34 | |
| 06/26/2018 16:53 EDT | 73.04 | 33.98 | |
| 06/26/2018 16:55 EDT | 73.4 | 33.34 | |
| 06/26/2018 17:00 EDT | 73.4 | 35.72 | |
| 06/26/2018 17:05 EDT | 73.4 | 35.72 | |
| 06/26/2018 17:10 EDT | 73.4 | 35.72 | |
| 06/26/2018 17:15 EDT | 73.4 | 35.72 | |
| 06/26/2018 17:20 EDT | 73.4 | 35.72 | |
| 06/26/2018 17:25 EDT | 71.6 | 37.95 | |
| 06/26/2018 17:30 EDT | 71.6 | 37.95 | |
| 06/26/2018 17:35 EDT | 71.6 | 37.95 | |
| 06/26/2018 17:40 EDT | 71.6 | 37.95 | |
| 06/26/2018 17:45 EDT | 71.6 | 43.48 | |
| 06/26/2018 17:50 EDT | 71.6 | 43.48 | |
| 06/26/2018 17:53 EDT | 71.06 | 45.49 | |

| | | | |
|---|---|---|---|
| 06/26/2018 17:55 EDT | 71.6 | 46.5 | |
| 06/26/2018 18:00 EDT | 69.8 | 46.22 | |
| 06/26/2018 18:05 EDT | 69.8 | 46.22 | |
| 06/26/2018 18:10 EDT | 69.8 | 46.22 | |
| 06/26/2018 18:15 EDT | 69.8 | 46.22 | |
| 06/26/2018 18:20 EDT | 69.8 | 46.22 | |
| 06/26/2018 18:25 EDT | 69.8 | 49.43 | |
| 06/26/2018 18:30 EDT | 69.8 | 52.83 | |
| 06/26/2018 18:35 EDT | 69.8 | 52.83 | |
| 06/26/2018 18:40 EDT | 69.8 | 52.83 | |
| 06/26/2018 18:45 EDT | 69.8 | 52.83 | |
| 06/26/2018 18:50 EDT | 69.8 | 52.83 | |
| 06/26/2018 18:53 EDT | 69.08 | 54.51 | |
| 06/26/2018 18:55 EDT | 69.8 | 52.83 | |
| 06/26/2018 19:00 EDT | 69.8 | 52.83 | |
| 06/26/2018 19:05 EDT | 68 | 56.19 | |
| 06/26/2018 19:10 EDT | 68 | 56.19 | |
| 06/26/2018 19:15 EDT | 68 | 56.19 | |
| 06/26/2018 19:20 EDT | 66.2 | 63.87 | |
| 06/26/2018 19:25 EDT | 66.2 | 63.87 | |
| 06/26/2018 19:30 EDT | 66.2 | 63.87 | |
| 06/26/2018 19:35 EDT | 66.2 | 63.87 | |
| 06/26/2018 19:40 EDT | 66.2 | 63.87 | |
| 06/26/2018 19:45 EDT | 66.2 | 63.87 | |
| 06/26/2018 19:50 EDT | 66.2 | 63.87 | |
| 06/26/2018 19:53 EDT | 66.02 | 65.12 | |
| 06/26/2018 19:55 EDT | 66.2 | 63.87 | |
| 06/26/2018 20:00 EDT | 64.4 | 67.99 | |
| 06/26/2018 20:05 EDT | 64.4 | 67.99 | |
| 06/26/2018 20:10 EDT | 64.4 | 72.6 | |
| 06/26/2018 20:15 EDT | 64.4 | 72.6 | |
| 06/26/2018 20:20 EDT | 64.4 | 72.6 | |
| 06/26/2018 20:25 EDT | 64.4 | 72.6 | |
| 06/26/2018 20:30 EDT | 64.4 | 72.6 | |
| 06/26/2018 20:35 EDT | 62.6 | 77.33 | |
| 06/26/2018 20:40 EDT | 62.6 | 82.52 | |
| 06/26/2018 20:45 EDT | 64.4 | 77.48 | |
| 06/26/2018 20:50 EDT | 64.4 | 77.48 | |
| 06/26/2018 20:53 EDT | 64.04 | 77.95 | |
| 06/26/2018 20:55 EDT | 62.6 | 82.52 | |
| 06/26/2018 21:00 EDT | 62.6 | 82.52 | |
| 06/26/2018 21:05 EDT | 62.6 | 82.52 | |
| 06/26/2018 21:10 EDT | 62.6 | 82.52 | |
| 06/26/2018 21:15 EDT | 62.6 | 82.52 | |
| 06/26/2018 21:20 EDT | 62.6 | 82.52 | |
| 06/26/2018 21:25 EDT | 62.6 | 82.52 | |
| 06/26/2018 21:30 EDT | 62.6 | 88.02 | |

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|---|---|---|---|
| 06/26/2018 21:35 EDT | 62.6 | 88.02 | |
| 06/26/2018 21:40 EDT | 62.6 | 88.02 | |
| 06/26/2018 21:45 EDT | 62.6 | 93.84 | |
| 06/26/2018 21:50 EDT | 62.6 | 93.84 | |
| 06/26/2018 21:53 EDT | 62.96 | 90.33 | |
| 06/26/2018 21:55 EDT | 62.6 | 93.84 | |
| 06/26/2018 22:00 EDT | 62.6 | 93.84 | |
| 06/26/2018 22:05 EDT | 62.6 | 93.84 | |
| 06/26/2018 22:10 EDT | 62.6 | 93.84 | |
| 06/26/2018 22:15 EDT | 62.6 | 93.84 | |
| 06/26/2018 22:20 EDT | 62.6 | 93.84 | |
| 06/26/2018 22:25 EDT | 62.6 | 93.84 | |
| 06/26/2018 22:30 EDT | 62.6 | 93.84 | |
| 06/26/2018 22:35 EDT | 62.6 | 93.84 | |
| 06/26/2018 22:40 EDT | 62.6 | 93.84 | |
| 06/26/2018 22:45 EDT | 62.6 | 93.84 | |
| 06/26/2018 22:50 EDT | 62.6 | 93.84 | |
| 06/26/2018 22:53 EDT | 62.06 | 96.26 | |
| 06/26/2018 22:55 EDT | 62.6 | 93.84 | |
| 06/26/2018 23:00 EDT | 62.6 | 100 | |
| 06/26/2018 23:05 EDT | 62.6 | 100 | |
| 06/26/2018 23:10 EDT | 62.6 | 100 | |
| 06/26/2018 23:15 EDT | 62.6 | 100 | |
| 06/26/2018 23:20 EDT | 62.6 | 100 | |
| 06/26/2018 23:25 EDT | 62.6 | 100 | |
| 06/26/2018 23:30 EDT | 62.6 | 100 | |
| 06/26/2018 23:35 EDT | 62.6 | 100 | |
| 06/26/2018 23:40 EDT | 62.6 | 100 | |
| 06/26/2018 23:45 EDT | 62.6 | 100 | |
| 06/26/2018 23:50 EDT | 62.6 | 100 | |
| 06/26/2018 23:53 EDT | 62.96 | 96.88 | |
| 06/26/2018 23:55 EDT | 62.6 | 100 | |
| 06/27/2018 00:00 EDT | 62.6 | 100 | |
| 06/27/2018 00:05 EDT | 62.6 | 100 | |
| 06/27/2018 00:10 EDT | 62.6 | 100 | |
| 06/27/2018 00:15 EDT | 62.6 | 100 | |
| 06/27/2018 00:20 EDT | 62.6 | 100 | |
| 06/27/2018 00:25 EDT | 62.6 | 100 | |
| 06/27/2018 00:30 EDT | 62.6 | 100 | |
| 06/27/2018 00:35 EDT | 62.6 | 100 | |
| 06/27/2018 00:40 EDT | 62.6 | 100 | |
| 06/27/2018 00:45 EDT | 62.6 | 100 | |
| 06/27/2018 00:50 EDT | 62.6 | 100 | |
| 06/27/2018 00:53 EDT | 62.06 | 100 | |
| 06/27/2018 00:55 EDT | 62.6 | 100 | |
| 06/27/2018 01:00 EDT | 62.6 | 100 | |
| 06/27/2018 01:05 EDT | 62.6 | 100 | |

| | | | |
|---|---|---|---|
| 06/27/2018 01:10 EDT | 62.6 | 100 | |
| 06/27/2018 01:15 EDT | 62.6 | 100 | |
| 06/27/2018 01:20 EDT | 62.6 | 100 | |
| 06/27/2018 01:25 EDT | 62.6 | 100 | |
| 06/27/2018 01:30 EDT | 62.6 | 100 | |
| 06/27/2018 01:35 EDT | 62.6 | 100 | |
| 06/27/2018 01:40 EDT | 62.6 | 100 | |
| 06/27/2018 01:45 EDT | 62.6 | 100 | |
| 06/27/2018 01:50 EDT | 62.6 | 100 | |
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| 06/27/2018 10:50 EDT | 73.4 | 49.97 | |
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| 06/27/2018 14:30 EDT | 73.4 | 49.97 | |
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| 06/27/2018 15:25 EDT | 73.4 | 53.36 | |
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| 06/27/2018 17:40 EDT | 71.6 | 73.32 | |
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| 06/27/2018 19:15 EDT | 69.8 | 64.32 | |

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| 06/28/2018 02:25 EDT | 69.8 | 88.37 | |

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| 06/28/2018 05:10 EDT | 69.8 | 94.03 | |
| 06/28/2018 05:15 EDT | 69.8 | 94.03 | |
| 06/28/2018 05:20 EDT | 69.8 | 94.03 | |
| 06/28/2018 05:25 EDT | 69.8 | 94.03 | |
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| 06/28/2018 05:50 EDT | 69.8 | 94.03 | |

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| 06/28/2018 15:15 EDT | 71.6 | 100 | |
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| 06/28/2018 16:15 EDT | 69.8 | 100 | 0.3 |
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| 06/28/2018 16:23 EDT | 69.98 | 100 | 0.32 |
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| 06/28/2018 16:35 EDT | 69.8 | 100 | 0.36 |
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| 06/28/2018 16:45 EDT | 69.8 | 100 | 0.36 |
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| 06/28/2018 18:40 EDT | 69.8 | 100 | 0.01 |

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| 06/29/2018 06:25 EDT | 69.8 | 100 | |
| 06/29/2018 06:30 EDT | 71.6 | 100 | |
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| 06/29/2018 06:50 EDT | 71.6 | 100 | |
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| 06/29/2018 06:55 EDT | 71.6 | 100 | |
| 06/29/2018 07:00 EDT | 73.4 | 94.12 | |
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| 06/29/2018 07:40 EDT | 73.4 | 94.12 | |

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| 06/29/2018 07:50 EDT | 75.2 | 88.62 | |
| 06/29/2018 07:53 EDT | 75.02 | 90.25 | |
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| 06/29/2018 08:20 EDT | 77 | 83.48 | |
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| 06/29/2018 08:45 EDT | 78.8 | 78.68 | |
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| 06/29/2018 09:15 EDT | 80.6 | 74.19 | |
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| 06/29/2018 09:35 EDT | 80.6 | 69.79 | |
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| 06/29/2018 09:53 EDT | 80.96 | 67.3 | |
| 06/29/2018 09:55 EDT | 80.6 | 69.79 | |
| 06/29/2018 10:00 EDT | 80.6 | 69.79 | |
| 06/29/2018 10:05 EDT | 82.4 | 65.83 | |
| 06/29/2018 10:10 EDT | 82.4 | 65.83 | |
| 06/29/2018 10:15 EDT | 80.6 | 69.79 | |
| 06/29/2018 10:20 EDT | 80.6 | 69.79 | |
| 06/29/2018 10:25 EDT | 82.4 | 65.83 | |
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| 06/29/2018 10:45 EDT | 82.4 | 69.98 | |
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| 06/29/2018 11:00 EDT | 80.6 | 69.79 | |
| 06/29/2018 11:05 EDT | 82.4 | 65.83 | |
| 06/29/2018 11:10 EDT | 80.6 | 69.79 | |
| 06/29/2018 11:15 EDT | 84.2 | 62.13 | |

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| 06/29/2018 11:20 EDT | 84.2 | 62.13 | |
| 06/29/2018 11:25 EDT | 82.4 | 65.83 | |
| 06/29/2018 11:30 EDT | 82.4 | 61.9 | |
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| 06/29/2018 12:00 EDT | 84.2 | 58.42 | |
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| 06/29/2018 12:20 EDT | 84.2 | 62.13 | |
| 06/29/2018 12:25 EDT | 84.2 | 58.42 | |
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| 06/29/2018 12:50 EDT | 82.4 | 69.98 | |
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| 06/29/2018 13:10 EDT | 84.2 | 66.04 | |
| 06/29/2018 13:15 EDT | 82.4 | 69.98 | |
| 06/29/2018 13:20 EDT | 82.4 | 74.36 | |
| 06/29/2018 13:25 EDT | 84.2 | 70.17 | |
| 06/29/2018 13:30 EDT | 82.4 | 69.98 | |
| 06/29/2018 13:35 EDT | 82.4 | 69.98 | |
| 06/29/2018 13:40 EDT | 84.2 | 66.04 | |
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| 06/29/2018 13:50 EDT | 82.4 | 69.98 | |
| 06/29/2018 13:53 EDT | 82.94 | 69.61 | |
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| 06/29/2018 14:30 EDT | 86 | 66.25 | |
| 06/29/2018 14:35 EDT | 84.2 | 70.17 | |
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| 06/29/2018 14:45 EDT | 84.2 | 66.04 | |
| 06/29/2018 14:50 EDT | 86 | 58.66 | |
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| 06/29/2018 15:35 EDT | 82.4 | 69.98 | |
| 06/29/2018 15:40 EDT | 84.2 | 66.04 | |
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| 06/29/2018 16:25 EDT | 84.2 | 62.13 | |
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| 06/29/2018 16:50 EDT | 84.2 | 62.13 | |
| 06/29/2018 16:53 EDT | 84.92 | 57.09 | |
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| 06/29/2018 17:15 EDT | 84.2 | 62.13 | |
| 06/29/2018 17:20 EDT | 84.2 | 62.13 | |
| 06/29/2018 17:25 EDT | 84.2 | 62.13 | |
| 06/29/2018 17:30 EDT | 84.2 | 62.13 | |
| 06/29/2018 17:35 EDT | 86 | 58.66 | |
| 06/29/2018 17:40 EDT | 86 | 58.66 | |
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| 06/29/2018 18:10 EDT | 84.2 | 62.13 | |
| 06/29/2018 18:15 EDT | 84.2 | 66.04 | |
| 06/29/2018 18:20 EDT | 84.2 | 66.04 | |
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| 06/29/2018 18:30 EDT | 84.2 | 66.04 | |

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| 06/29/2018 18:40 EDT | 84.2 | 66.04 | |
| 06/29/2018 18:45 EDT | 84.2 | 66.04 | |
| 06/29/2018 18:50 EDT | 82.4 | 69.98 | |
| 06/29/2018 18:53 EDT | 82.94 | 69.61 | |
| 06/29/2018 18:55 EDT | 82.4 | 69.98 | |
| 06/29/2018 19:00 EDT | 82.4 | 69.98 | |
| 06/29/2018 19:05 EDT | 82.4 | 69.98 | |
| 06/29/2018 19:10 EDT | 84.2 | 62.13 | |
| 06/29/2018 19:15 EDT | 84.2 | 58.42 | |
| 06/29/2018 19:20 EDT | 84.2 | 58.42 | |
| 06/29/2018 19:25 EDT | 82.4 | 58.18 | |
| 06/29/2018 19:30 EDT | 82.4 | 58.18 | |
| 06/29/2018 19:35 EDT | 82.4 | 58.18 | |
| 06/29/2018 19:40 EDT | 82.4 | 58.18 | |
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| 06/29/2018 19:55 EDT | 78.8 | 69.6 | |
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| 06/29/2018 20:05 EDT | 78.8 | 69.6 | |
| 06/29/2018 20:10 EDT | 77 | 69.4 | |
| 06/29/2018 20:15 EDT | 77 | 69.4 | |
| 06/29/2018 20:20 EDT | 75.2 | 73.67 | |
| 06/29/2018 20:25 EDT | 77 | 69.4 | |
| 06/29/2018 20:30 EDT | 77 | 69.4 | |
| 06/29/2018 20:35 EDT | 75.2 | 73.67 | |
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| 06/29/2018 20:53 EDT | 73.94 | 76.36 | |
| 06/29/2018 20:55 EDT | 73.4 | 78.24 | |
| 06/29/2018 21:00 EDT | 75.2 | 73.67 | |
| 06/29/2018 21:05 EDT | 73.4 | 78.24 | |
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| 06/29/2018 21:45 EDT | 71.6 | 88.46 | |
| 06/29/2018 21:50 EDT | 71.6 | 88.46 | |
| 06/29/2018 21:53 EDT | 69.98 | 93.45 | |
| 06/29/2018 21:55 EDT | 69.8 | 94.03 | |
| 06/29/2018 22:00 EDT | 68 | 100 | |
| 06/29/2018 22:05 EDT | 68 | 93.98 | |

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| 06/29/2018 22:20 EDT | 69.8 | 94.03 | |
| 06/29/2018 22:25 EDT | 69.8 | 94.03 | |
| 06/29/2018 22:30 EDT | 69.8 | 94.03 | |
| 06/29/2018 22:35 EDT | 69.8 | 94.03 | |
| 06/29/2018 22:40 EDT | 68 | 100 | |
| 06/29/2018 22:45 EDT | 66.2 | 100 | |
| 06/29/2018 22:50 EDT | 66.2 | 100 | |
| 06/29/2018 22:53 EDT | 66.92 | 100 | |
| 06/29/2018 22:55 EDT | 66.2 | 100 | |
| 06/29/2018 23:00 EDT | 66.2 | 100 | |
| 06/29/2018 23:05 EDT | 66.2 | 100 | |
| 06/29/2018 23:10 EDT | 66.2 | 100 | |
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| 06/29/2018 23:20 EDT | 66.2 | 100 | |
| 06/29/2018 23:25 EDT | 66.2 | 100 | |
| 06/29/2018 23:30 EDT | 66.2 | 100 | |
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| 06/29/2018 23:40 EDT | 66.2 | 100 | |
| 06/29/2018 23:45 EDT | 66.2 | 100 | |
| 06/29/2018 23:50 EDT | 68 | 93.98 | |
| 06/29/2018 23:53 EDT | 66.92 | 100 | |
| 06/29/2018 23:55 EDT | 66.2 | 100 | |
| 06/30/2018 00:00 EDT | 66.2 | 100 | |
| 06/30/2018 00:05 EDT | 66.2 | 100 | |
| 06/30/2018 00:10 EDT | 66.2 | 100 | |
| 06/30/2018 00:15 EDT | 66.2 | 100 | |
| 06/30/2018 00:20 EDT | 66.2 | 100 | |
| 06/30/2018 00:25 EDT | 66.2 | 100 | |
| 06/30/2018 00:30 EDT | 66.2 | 100 | |
| 06/30/2018 00:35 EDT | 66.2 | 100 | |
| 06/30/2018 00:40 EDT | 66.2 | 100 | |
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| 06/30/2018 00:50 EDT | 66.2 | 100 | |
| 06/30/2018 00:53 EDT | 66.92 | 96.94 | |
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| 06/30/2018 01:00 EDT | 66.2 | 100 | |
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| 06/30/2018 01:10 EDT | 66.2 | 100 | |
| 06/30/2018 01:15 EDT | 66.2 | 100 | |
| 06/30/2018 01:20 EDT | 66.2 | 100 | |
| 06/30/2018 01:25 EDT | 64.4 | 100 | |
| 06/30/2018 01:30 EDT | 64.4 | 100 | |
| 06/30/2018 01:35 EDT | 64.4 | 100 | |
| 06/30/2018 01:40 EDT | 64.4 | 100 | |
| 06/30/2018 01:45 EDT | 66.2 | 93.94 | |

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| 06/30/2018 01:53 EDT | 66.92 | 93.37 | |
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| 06/30/2018 02:10 EDT | 66.2 | 100 | |
| 06/30/2018 02:15 EDT | 66.2 | 93.94 | |
| 06/30/2018 02:20 EDT | 66.2 | 93.94 | |
| 06/30/2018 02:25 EDT | 64.4 | 100 | |
| 06/30/2018 02:30 EDT | 64.4 | 100 | |
| 06/30/2018 02:35 EDT | 64.4 | 100 | |
| 06/30/2018 02:40 EDT | 64.4 | 93.89 | |
| 06/30/2018 02:45 EDT | 64.4 | 100 | |
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| 06/30/2018 03:10 EDT | 64.4 | 100 | |
| 06/30/2018 03:15 EDT | 64.4 | 100 | |
| 06/30/2018 03:20 EDT | 64.4 | 100 | |
| 06/30/2018 03:25 EDT | 64.4 | 100 | |
| 06/30/2018 03:30 EDT | 66.2 | 93.94 | |
| 06/30/2018 03:35 EDT | 68 | 88.29 | |
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| 06/30/2018 04:00 EDT | 64.4 | 100 | |
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| 06/30/2018 06:45 EDT | 69.8 | 94.03 | |
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| 06/30/2018 07:10 EDT | 73.4 | 83.25 | |
| 06/30/2018 07:15 EDT | 73.4 | 83.25 | |
| 06/30/2018 07:20 EDT | 73.4 | 83.25 | |
| 06/30/2018 07:25 EDT | 75.2 | 78.39 | |
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| 06/30/2018 08:50 EDT | 82.4 | 65.83 | |
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| 06/30/2018 08:55 EDT | 80.6 | 69.79 | |

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| 06/30/2018 09:05 EDT | 82.4 | 65.83 | |
| 06/30/2018 09:10 EDT | 82.4 | 65.83 | |
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| 06/30/2018 09:45 EDT | 82.4 | 65.83 | |
| 06/30/2018 09:50 EDT | 82.4 | 65.83 | |
| 06/30/2018 09:53 EDT | 82.94 | 60.83 | |
| 06/30/2018 09:55 EDT | 82.4 | 65.83 | |
| 06/30/2018 10:00 EDT | 84.2 | 62.13 | |
| 06/30/2018 10:05 EDT | 84.2 | 62.13 | |
| 06/30/2018 10:10 EDT | 84.2 | 58.42 | |
| 06/30/2018 10:15 EDT | 84.2 | 58.42 | |
| 06/30/2018 10:20 EDT | 84.2 | 54.9 | |
| 06/30/2018 10:25 EDT | 84.2 | 54.9 | |
| 06/30/2018 10:30 EDT | 84.2 | 54.9 | |
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| 06/30/2018 10:50 EDT | 84.2 | 58.42 | |
| 06/30/2018 10:53 EDT | 84.92 | 59.24 | |
| 06/30/2018 10:55 EDT | 84.2 | 62.13 | |
| 06/30/2018 11:00 EDT | 84.2 | 62.13 | |
| 06/30/2018 11:05 EDT | 84.2 | 62.13 | |
| 06/30/2018 11:10 EDT | 84.2 | 58.42 | |
| 06/30/2018 11:15 EDT | 84.2 | 54.9 | |
| 06/30/2018 11:20 EDT | 84.2 | 54.9 | |
| 06/30/2018 11:25 EDT | 84.2 | 54.9 | |
| 06/30/2018 11:30 EDT | 86 | 51.84 | |
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| 06/30/2018 11:40 EDT | 86 | 51.84 | |
| 06/30/2018 11:45 EDT | 84.2 | 54.9 | |
| 06/30/2018 11:50 EDT | 86 | 51.84 | |
| 06/30/2018 11:53 EDT | 86 | 53.14 | |
| 06/30/2018 11:55 EDT | 86 | 51.84 | |
| 06/30/2018 12:00 EDT | 86 | 51.84 | |
| 06/30/2018 12:05 EDT | 84.2 | 54.9 | |
| 06/30/2018 12:10 EDT | 84.2 | 54.9 | |
| 06/30/2018 12:15 EDT | 86 | 51.84 | |
| 06/30/2018 12:20 EDT | 86 | 51.84 | |
| 06/30/2018 12:25 EDT | 86 | 51.84 | |
| 06/30/2018 12:30 EDT | 86 | 51.84 | |
| 06/30/2018 12:35 EDT | 86 | 48.69 | |

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| 06/30/2018 12:40 EDT | 86 | 48.69 | |
| 06/30/2018 12:45 EDT | 87.8 | 48.96 | |
| 06/30/2018 12:50 EDT | 87.8 | 48.96 | |
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| 06/30/2018 12:55 EDT | 87.8 | 48.96 | |
| 06/30/2018 13:00 EDT | 87.8 | 48.96 | |
| 06/30/2018 13:05 EDT | 87.8 | 48.96 | |
| 06/30/2018 13:10 EDT | 87.8 | 48.96 | |
| 06/30/2018 13:15 EDT | 87.8 | 52.09 | |
| 06/30/2018 13:20 EDT | 87.8 | 48.96 | |
| 06/30/2018 13:25 EDT | 87.8 | 48.96 | |
| 06/30/2018 13:30 EDT | 87.8 | 48.96 | |
| 06/30/2018 13:35 EDT | 87.8 | 52.09 | |
| 06/30/2018 13:40 EDT | 89.6 | 52.35 | |
| 06/30/2018 13:45 EDT | 87.8 | 48.96 | |
| 06/30/2018 13:50 EDT | 87.8 | 48.96 | |
| 06/30/2018 13:53 EDT | 87.98 | 49.91 | |
| 06/30/2018 13:55 EDT | 87.8 | 48.96 | |
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| 06/30/2018 14:05 EDT | 87.8 | 48.96 | |
| 06/30/2018 14:10 EDT | 87.8 | 48.96 | |
| 06/30/2018 14:15 EDT | 87.8 | 48.96 | |
| 06/30/2018 14:20 EDT | 87.8 | 52.09 | |
| 06/30/2018 14:25 EDT | 87.8 | 55.4 | |
| 06/30/2018 14:30 EDT | 87.8 | 55.4 | |
| 06/30/2018 14:35 EDT | 87.8 | 55.4 | |
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| 06/30/2018 14:45 EDT | 87.8 | 55.4 | |
| 06/30/2018 14:50 EDT | 87.8 | 55.4 | |
| 06/30/2018 14:53 EDT | 87.98 | 51.8 | |
| 06/30/2018 14:55 EDT | 87.8 | 55.4 | |
| 06/30/2018 15:00 EDT | 87.8 | 55.4 | |
| 06/30/2018 15:05 EDT | 86 | 55.15 | |
| 06/30/2018 15:10 EDT | 86 | 55.15 | |
| 06/30/2018 15:15 EDT | 86 | 51.84 | |
| 06/30/2018 15:20 EDT | 87.8 | 52.09 | |
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| 06/30/2018 15:30 EDT | 86 | 58.66 | |
| 06/30/2018 15:35 EDT | 84.2 | 62.13 | |
| 06/30/2018 15:40 EDT | 84.2 | 58.42 | |
| 06/30/2018 15:45 EDT | 84.2 | 58.42 | |
| 06/30/2018 15:50 EDT | 82.4 | 58.18 | |
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| 06/30/2018 16:10 EDT | 84.2 | 58.42 | |

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| 06/30/2018 16:20 EDT | 84.2 | 62.13 | |
| 06/30/2018 16:25 EDT | 84.2 | 62.13 | |
| 06/30/2018 16:30 EDT | 84.2 | 58.42 | |
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| 06/30/2018 16:40 EDT | 84.2 | 58.42 | |
| 06/30/2018 16:45 EDT | 84.2 | 62.13 | |
| 06/30/2018 16:50 EDT | 84.2 | 58.42 | |
| 06/30/2018 16:53 EDT | 84.92 | 55 | |
| 06/30/2018 16:55 EDT | 84.2 | 54.9 | |
| 06/30/2018 17:00 EDT | 84.2 | 54.9 | |
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| 06/30/2018 17:15 EDT | 84.2 | 54.9 | |
| 06/30/2018 17:20 EDT | 84.2 | 51.58 | |
| 06/30/2018 17:25 EDT | 84.2 | 54.9 | |
| 06/30/2018 17:30 EDT | 84.2 | 54.9 | |
| 06/30/2018 17:35 EDT | 84.2 | 54.9 | |
| 06/30/2018 17:40 EDT | 84.2 | 54.9 | |
| 06/30/2018 17:45 EDT | 84.2 | 54.9 | |
| 06/30/2018 17:50 EDT | 84.2 | 54.9 | |
| 06/30/2018 17:53 EDT | 84.92 | 55 | |
| 06/30/2018 17:55 EDT | 84.2 | 54.9 | |
| 06/30/2018 18:00 EDT | 84.2 | 54.9 | |
| 06/30/2018 18:05 EDT | 84.2 | 54.9 | |
| 06/30/2018 18:10 EDT | 84.2 | 54.9 | |
| 06/30/2018 18:15 EDT | 84.2 | 54.9 | |
| 06/30/2018 18:20 EDT | 84.2 | 54.9 | |
| 06/30/2018 18:25 EDT | 84.2 | 54.9 | |
| 06/30/2018 18:30 EDT | 82.4 | 58.18 | |
| 06/30/2018 18:35 EDT | 82.4 | 58.18 | |
| 06/30/2018 18:40 EDT | 80.6 | 61.67 | |
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| 06/30/2018 18:50 EDT | 80.6 | 61.67 | |
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| 06/30/2018 19:20 EDT | 80.6 | 61.67 | |
| 06/30/2018 19:25 EDT | 80.6 | 65.62 | |
| 06/30/2018 19:30 EDT | 80.6 | 65.62 | |
| 06/30/2018 19:35 EDT | 80.6 | 61.67 | |
| 06/30/2018 19:40 EDT | 78.8 | 65.41 | |
| 06/30/2018 19:45 EDT | 78.8 | 65.41 | |
| 06/30/2018 19:50 EDT | 78.8 | 65.41 | |

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| 06/30/2018 19:55 EDT | 78.8 | 69.6 | |
| 06/30/2018 20:00 EDT | 77 | 73.85 | |
| 06/30/2018 20:05 EDT | 77 | 73.85 | |
| 06/30/2018 20:10 EDT | 75.2 | 78.39 | |
| 06/30/2018 20:15 EDT | 75.2 | 78.39 | |
| 06/30/2018 20:20 EDT | 75.2 | 78.39 | |
| 06/30/2018 20:25 EDT | 75.2 | 78.39 | |
| 06/30/2018 20:30 EDT | 75.2 | 78.39 | |
| 06/30/2018 20:35 EDT | 73.4 | 83.25 | |
| 06/30/2018 20:40 EDT | 73.4 | 88.54 | |
| 06/30/2018 20:45 EDT | 75.2 | 78.39 | |
| 06/30/2018 20:50 EDT | 75.2 | 78.39 | |
| 06/30/2018 20:53 EDT | 73.94 | 81.76 | |
| 06/30/2018 20:55 EDT | 73.4 | 83.25 | |
| 06/30/2018 21:00 EDT | 73.4 | 83.25 | |
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| 06/30/2018 21:10 EDT | 73.4 | 83.25 | |
| 06/30/2018 21:15 EDT | 73.4 | 83.25 | |
| 06/30/2018 21:20 EDT | 73.4 | 83.25 | |
| 06/30/2018 21:25 EDT | 73.4 | 83.25 | |
| 06/30/2018 21:30 EDT | 71.6 | 88.46 | |
| 06/30/2018 21:35 EDT | 71.6 | 88.46 | |
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| 06/30/2018 21:45 EDT | 71.6 | 88.46 | |
| 06/30/2018 21:50 EDT | 73.4 | 83.25 | |
| 06/30/2018 21:53 EDT | 73.04 | 84.26 | |
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| 06/30/2018 22:00 EDT | 71.6 | 88.46 | |
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| 06/30/2018 22:10 EDT | 71.6 | 88.46 | |
| 06/30/2018 22:15 EDT | 71.6 | 88.46 | |
| 06/30/2018 22:20 EDT | 69.8 | 94.03 | |
| 06/30/2018 22:25 EDT | 69.8 | 94.03 | |
| 06/30/2018 22:30 EDT | 71.6 | 88.46 | |
| 06/30/2018 22:35 EDT | 71.6 | 88.46 | |
| 06/30/2018 22:40 EDT | 71.6 | 88.46 | |
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| 06/30/2018 22:50 EDT | 71.6 | 88.46 | |
| 06/30/2018 22:53 EDT | 71.06 | 90.09 | |
| 06/30/2018 22:55 EDT | 71.6 | 88.46 | |
| 06/30/2018 23:00 EDT | 71.6 | 88.46 | |
| 06/30/2018 23:05 EDT | 71.6 | 88.46 | |
| 06/30/2018 23:10 EDT | 69.8 | 94.03 | |
| 06/30/2018 23:15 EDT | 71.6 | 88.46 | |
| 06/30/2018 23:20 EDT | 69.8 | 94.03 | |
| 06/30/2018 23:25 EDT | 69.8 | 94.03 | |

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| 06/30/2018 23:30 EDT | 71.6 | 88.46 | |
| 06/30/2018 23:35 EDT | 69.8 | 94.03 | |
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| 06/30/2018 23:45 EDT | 69.8 | 94.03 | |
| 06/30/2018 23:50 EDT | 69.8 | 88.37 | |
| 06/30/2018 23:53 EDT | 69.08 | 92.85 | 0.001 |
| 06/30/2018 23:55 EDT | 69.8 | 88.37 | |
| 07/01/2018 00:00 EDT | 68 | 93.98 | |
| 07/01/2018 00:05 EDT | 68 | 93.98 | |
| 07/01/2018 00:10 EDT | 68 | 93.98 | |
| 07/01/2018 00:15 EDT | 69.8 | 88.37 | |
| 07/01/2018 00:20 EDT | 69.8 | 88.37 | |
| 07/01/2018 00:25 EDT | 69.8 | 88.37 | |
| 07/01/2018 00:30 EDT | 69.8 | 88.37 | |
| 07/01/2018 00:35 EDT | 69.8 | 88.37 | |
| 07/01/2018 00:40 EDT | 68 | 93.98 | |
| 07/01/2018 00:45 EDT | 68 | 93.98 | |
| 07/01/2018 00:50 EDT | 68 | 93.98 | |
| 07/01/2018 00:53 EDT | 68 | 96.35 | |
| 07/01/2018 00:55 EDT | 68 | 93.98 | |
| 07/01/2018 01:00 EDT | 68 | 93.98 | |
| 07/01/2018 01:05 EDT | 68 | 93.98 | |
| 07/01/2018 01:10 EDT | 68 | 93.98 | |
| 07/01/2018 01:15 EDT | 68 | 93.98 | |
| 07/01/2018 01:20 EDT | 66.2 | 100 | |
| 07/01/2018 01:25 EDT | 66.2 | 100 | |
| 07/01/2018 01:30 EDT | 66.2 | 100 | |
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| 07/01/2018 01:45 EDT | 68 | 93.98 | |
| 07/01/2018 01:50 EDT | 68 | 93.98 | |
| 07/01/2018 01:53 EDT | 68 | 96.35 | |
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| 07/01/2018 02:00 EDT | 66.2 | 100 | |
| 07/01/2018 02:05 EDT | 66.2 | 100 | |
| 07/01/2018 02:10 EDT | 66.2 | 100 | |
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| 07/01/2018 02:20 EDT | 68 | 93.98 | |
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| 07/01/2018 02:30 EDT | 68 | 93.98 | |
| 07/01/2018 02:35 EDT | 68 | 93.98 | |
| 07/01/2018 02:40 EDT | 68 | 93.98 | |
| 07/01/2018 02:45 EDT | 66.2 | 100 | |
| 07/01/2018 02:50 EDT | 66.2 | 100 | |
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| 07/01/2018 02:55 EDT | 66.2 | 100 | |
| 07/01/2018 03:00 EDT | 68 | 93.98 | |

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| 07/01/2018 03:05 EDT | 66.2 | 100 | |
| 07/01/2018 03:10 EDT | 68 | 93.98 | |
| 07/01/2018 03:15 EDT | 68 | 93.98 | |
| 07/01/2018 03:20 EDT | 68 | 93.98 | |
| 07/01/2018 03:25 EDT | 66.2 | 100 | |
| 07/01/2018 03:30 EDT | 66.2 | 100 | |
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| 07/01/2018 03:40 EDT | 66.2 | 100 | |
| 07/01/2018 03:45 EDT | 66.2 | 100 | |
| 07/01/2018 03:50 EDT | 68 | 93.98 | |
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| 07/01/2018 04:05 EDT | 66.2 | 100 | |
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| 07/01/2018 04:15 EDT | 66.2 | 100 | |
| 07/01/2018 04:20 EDT | 66.2 | 100 | |
| 07/01/2018 04:25 EDT | 68 | 93.98 | |
| 07/01/2018 04:30 EDT | 68 | 93.98 | |
| 07/01/2018 04:35 EDT | 69.8 | 88.37 | |
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| 07/01/2018 04:53 EDT | 68 | 93.4 | |
| 07/01/2018 04:55 EDT | 68 | 93.98 | |
| 07/01/2018 05:00 EDT | 66.2 | 93.94 | |
| 07/01/2018 05:05 EDT | 66.2 | 93.94 | |
| 07/01/2018 05:10 EDT | 66.2 | 100 | |
| 07/01/2018 05:15 EDT | 66.2 | 100 | |
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| 07/01/2018 05:53 EDT | 68 | 93.4 | |
| 07/01/2018 05:55 EDT | 69.8 | 88.37 | |
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| 07/01/2018 06:05 EDT | 69.8 | 88.37 | |
| 07/01/2018 06:10 EDT | 69.8 | 94.03 | |
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| 07/01/2018 06:25 EDT | 69.8 | 88.37 | |
| 07/01/2018 06:30 EDT | 69.8 | 88.37 | |
| 07/01/2018 06:35 EDT | 69.8 | 94.03 | |
| 07/01/2018 06:40 EDT | 69.8 | 94.03 | |

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| 07/01/2018 06:50 EDT | 71.6 | 88.46 | |
| 07/01/2018 06:53 EDT | 71.96 | 87.39 | |
| 07/01/2018 06:55 EDT | 71.6 | 94.07 | |
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| 07/01/2018 07:10 EDT | 73.4 | 88.54 | |
| 07/01/2018 07:15 EDT | 73.4 | 88.54 | |
| 07/01/2018 07:20 EDT | 75.2 | 83.37 | |
| 07/01/2018 07:25 EDT | 75.2 | 83.37 | |
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| 07/01/2018 07:45 EDT | 75.2 | 83.37 | |
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| 07/01/2018 08:25 EDT | 80.6 | 74.19 | |
| 07/01/2018 08:30 EDT | 82.4 | 69.98 | |
| 07/01/2018 08:35 EDT | 82.4 | 69.98 | |
| 07/01/2018 08:40 EDT | 82.4 | 69.98 | |
| 07/01/2018 08:45 EDT | 82.4 | 69.98 | |
| 07/01/2018 08:50 EDT | 82.4 | 74.36 | |
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| 07/01/2018 09:05 EDT | 82.4 | 74.36 | |
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| 07/01/2018 09:53 EDT | 84.92 | 69.82 | |
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| 07/01/2018 10:05 EDT | 84.2 | 70.17 | |
| 07/01/2018 10:10 EDT | 84.2 | 66.04 | |
| 07/01/2018 10:15 EDT | 84.2 | 70.17 | |

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| 07/01/2018 10:25 EDT | 86 | 66.25 | |
| 07/01/2018 10:30 EDT | 87.8 | 62.58 | |
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| 07/01/2018 10:40 EDT | 87.8 | 66.46 | |
| 07/01/2018 10:45 EDT | 89.6 | 62.8 | |
| 07/01/2018 10:50 EDT | 89.6 | 62.8 | |
| 07/01/2018 10:53 EDT | 89.96 | 61.72 | |
| 07/01/2018 10:55 EDT | 89.6 | 62.8 | |
| 07/01/2018 11:00 EDT | 89.6 | 62.8 | |
| 07/01/2018 11:05 EDT | 89.6 | 62.8 | |
| 07/01/2018 11:10 EDT | 91.4 | 59.36 | |
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| 07/01/2018 13:00 EDT | 95 | 53.11 | |
| 07/01/2018 13:05 EDT | 93.2 | 52.86 | |
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| 07/01/2018 13:15 EDT | 91.4 | 63.02 | |
| 07/01/2018 13:20 EDT | 91.4 | 63.02 | |
| 07/01/2018 13:25 EDT | 91.4 | 59.36 | |
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ATTACHMENT 14

# AIR QUALITY IMPACTS

Massachusetts Environmental Policy Act
*Air and Odor Analysis*

# Parallel Products of New England
## New Bedford, Massachusetts

*Submitted to:*
PARALLEL PRODUCTS OF NEW ENGLAND, INC.
100 Duchaine Boulevard
New Bedford, MA 02745

PARALLEL PRODUCTS

*Submitted by:*
**EPSILON ASSOCIATES, INC.**
3 Mill & Main Place, Suite 250
Maynard, MA 01754

Epsilon ASSOCIATES INC.

**September 23, 2019**

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# 1.0 EXECUTIVE SUMMARY

*Executive Summary*

Parallel Products of New England (PPNE) has commissioned this study to document that the solid waste facility proposed for 100 Duchaine Boulevard in New Bedford, Massachusetts uses all feasible measures to avoid, minimize, and mitigate potential air-related impacts, and that the facility will not create conditions of unhealthy air or nuisance odors. The study documents this through a three-step process for each relevant concern:

1. Emissions estimates: The project team has assembled information on the proposed activities, and used United States Environmental Protection Agency (USEPA) emission limits, emission factors, industry data, and information for other projects to generate emission rates. The analysis generally uses expected maximum operating rates to generate conservative estimates.

2. Computer air dispersion modeling: The model generates a 3-D field using terrain data and building dimensions. Epsilon created a grid of thousands of receptor locations, with the most receptors nearest the facility. The model uses emission rates, exhaust parameters (release height, velocity, and temperature) and five years of hourly weather data to predict ambient air concentrations in all weather conditions.

3. Comparison to standards: Model results are compared to USEPA and Massachusetts Department of Environmental Protection (MassDEP) health-protective criteria. Odor impacts are subjective and individualized; for odor, model results are compared to a dilution threshold that is unlikely to cause a nuisance condition, and the results are assessed based on both the frequency and intensity of the modeled concentration.

*Sources of Air Emissions*

Stationary sources at the facility will be subject to regulation by MassDEP, either through the Limited Plan Approval process or by regulation of de minimis sources. This study reviews stationary sources but also heavy mobile equipment sources, and truck traffic both on-site and off-site. This more inclusive analysis allows the project to be designed holistically to minimize environmental impacts and give a more complete picture of any project related air impacts.

Broadly the emissions sources are in the following categories:

- Stationary combustion sources. There are boiler and dryers which will provide freeze protection and energy for the biosolids drying process. Additionally, space heaters will provide heat to the glass processing building. These combust natural gas and are below MassDEP permitting thresholds. They are generally of the size found providing heat to commercial buildings.

- Mobile diesel equipment. Parallel Products will use standard commercial equipment (trucks and front-end loaders) common to on-road and off-road traffic.

- Dust from material handling. Emissions are estimated based on material transfer operations, and road dust. A cooling tower can also be a dust source (as mist droplets evaporate, salts in the water can remain in the air); the cooling tower is an insignificant source per MassDEP standards and is similar in size to towers serving commercial buildings.

- Potential odor sources. Biosolids and municipal solid waste (MSW) can be sources of odor.

### *Impacts*

Parallel Products proposes a facility that avoids, minimizes, and mitigates potential air-related impacts as follows:

Avoided impacts: Parallel Products has selected an industrially-zoned setting to avoid impacts to the public and is re-using significant existing infrastructure to avoid impacts associated with new construction. Material handling in enclosed areas, using best industry practices, minimizes off-site impacts of air emissions and odors. Because the proposed facility will serve existing needs for material handling at a location that is closer to the sources of the materials, the project avoids transportation-related impacts currently associated with sending the materials farther by truck.

Minimized impacts: The project team evaluated and modeled dozens of potential equipment and exhaust vent/stack configurations to identify the proposed conceptual design which minimizes off-site air and odor concentrations. The proposed design optimizes the flow of material through the site, and the reuse of existing facilities, while minimizing offsite impacts in general and residential area offsite impacts in particular. Material handling loaders will be USEPA Tier 4 certified to minimize emissions.

Mitigated impacts: Parallel Products is selecting to control odors from biosolids handling processes using biofiltration with carbon/zeolite polishing, or equal, and ionization. Specific controls for the biosolids processing operations, including the dryer exhausts, are currently conceptually designed. As project design advances, the specific odor control technology will be selected.

### *Comparison to Standards*

The analysis shows that, under maximum expected operating conditions and using conservative assumptions, the project's impacts will comply with all applicable standards. Specifically:

- The National Ambient Air Quality Standards (NAAQS) will not be exceeded. Per USEPA, these standards "provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly.[1]"

- The Ambient Air Quality Standards for the Commonwealth of Massachusetts (MAAQS) will not be exceeded. Per 310 CMR 6.00, the MAAQS are currently identical to the NAAQS. In this report, the term "NAAQS" will refer to both sets of standards.

- MassDEP has developed "health- and science-based air guidelines - known as Ambient Air Limits (AALs) and Threshold Effect Exposure Limits (TELs) - to evaluate potential human health risks from exposures to chemicals in air.2" In some cases, MassDEP had not developed an AAL or TEL for a particular chemical. In these cases, the USEPA Integrated Risk Information System (IRIS) was reviewed for that chemical to determine if a reference concentration (RFC) existed. The reference concentration is derived in a similar manner as the AAL and TEL concentrations and represents a concentration protective of the general population and sensitive subpopulations.

In Massachusetts, odor is regulated under 310 CMR 7.09 such that operations that emit odors shall not permit their emissions to "cause a condition of air pollution". To determine that the project is not a nuisance source of odors, the study evaluated for maximum 5-minute-averaged odor concentrations and determined that, for all locations on-site and off-site and given evaluated weather conditions, the odor concentration to be at or below 5 dilution-to-threshold (D/T). Thus, the project meets the criterion published in the MassDEP draft policy for odor from composting facilities.

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1 https://www.epa.gov/criteria-air-pollutants/naaqs-table

2 https://www.mass.gov/service-details/massdep-ambient-air-toxics-guidelines

# 2.0 INTRODUCTION

This report documents air and odor emissions estimates and related ambient impacts for the proposed Parallel Products of New England (PPNE) solid waste facility to be located at 100 Duchaine Boulevard in New Bedford, Massachusetts.

## 2.1 Site Description

The site is an industrially zoned, approximately 71-acre parcel, located within the New Bedford Business Park. The site location and property boundaries are shown in **Figure 1** using an aerial view. The site was previously developed by Polaroid and already includes access roads, parking areas, and various buildings. Much of the existing infrastructure will be used in developing the proposed project. New buildings will be constructed for glass processing, municipal solid waste (MSW) and construction and demolition (C&D) waste tipping, and biosolids drying. The conceptual layout of the future and existing buildings is shown in **Figure 2** which presents a plan view.

The site is bounded on the west by undevelopable wetlands, to the north by several commercial or industrial operations unrelated to PPNE's project, to the east by residential neighborhoods, and to the south by a utility operations and maintenance facility. The properties to the west, north, and south are industrially zoned.

## 2.2 Project Description

PPNE plans to operate several solid waste and recycling related processes at the site:

(1) Phase 1 – Processing of redemption and recovered glass to cullet for rail haul to out-of-state recycling facilities [250 tons per day (TPD) glass handling capacity, 75,000 tons per year (TPY) throughput];

(2) Phase 2 – Processing of MSW to recover approximately 20 percent recyclables and to bale and rail haul the post-reclamation MSW, with C&D waste, to out-of-state waste disposal facilities (1,500 TPD MSW and C&D waste handling capacity, 450,000 TPY throughput);

(3) Phase 3 – Receipt of biosolids liquid sludge for dewatering to cake and receipt of biosolids cake, with drying of the cake to 93 percent solids for rail haul to out-of-state disposal facilities [50 dry TPD (DTPD) biosolids capacity, 15,000 dry TPY (DTPY) throughput].

While the goal is to rail haul most of the products and residuals off-site, the air emissions estimates, and related ambient impacts have been based on use of trucks to haul materials on and off-site. This will overstate the air impacts when compared to future, predominate use of rail haul.

## 2.3 Outline of Report

This report describes the sources of air emissions included in the ambient air and odor impacts analysis (Section 3), the methodologies and bases for derivation of air emission estimates (Section 4), and the air regulatory applicability framework for the project (Section 5). Section 6.1 contains a description of the methodologies and bases for preparation of the ambient air impacts analyses. The criteria used in analyses and results of the analyses are presented in Section 6.2 (Criteria Pollutants), Section 6.3 (Air Toxics), and Section 6.4 (Odor).

# 3.0 SOURCE DESCRIPTIONS

This section describes the types of air and odor emitting sources included in the ambient air and odor impacts analysis.

## 3.1 Combustion Sources

The analysis presented in this report encompasses a broader range of air emission sources than would be included in an air plan application in that certain mobile combustion sources are included in addition to all stationary combustion sources located at the site.

### *3.1.1 Stationary Sources*

The MSW tipping and processing building will be an unconditioned space, and thus no combustion sources will be used to heat this structure. The biosolids building and glass processing buildings will be heated to 50 degrees Fahrenheit in the wintertime. For this analysis, each building is assumed to use a nominal 3 million British thermal units per hour (MMBtu/hr) heating source (a small boiler for the biosolids building and small space heaters for the glass processing buildings), stated on a higher heating value (HHV) basis. In addition to the boiler, the biosolids building will also house four nominal 5 MMBtu/hr (HHV) heat input dryers, each fitted with its own burner.

### *3.1.2 Mobile Sources*

Both on-site and off-site mobile sources are included in the analysis.

On-site mobile sources include two glass handling front-end loaders, two MSW handling front-end loaders, and all truck traffic on site. The glass handling front-end loaders will operate for up to 3 hours per day each, and the nominal engine size of each is 155-horsepower. Two MSW handling front-end loaders will operate at a time during the 16-hour day shift, and only one will operate during the 8-hour night shift (for a total of 40 hours per day operation), and the nominal engine size of each is 267-horsepower. The glass handling loaders and the MSW handling loaders will be USEPA Tier 4 certified. On-site truck traffic volume and frequency were deduced from the Updated Traffic Impact Study (TIS) included in the Draft Environmental Impact Report (DEIR), and all on-site trucks were assumed to be heavy duty diesel powered.

Off-site mobile sources include recycled glass, MSW, C&D, and biosolids truck traffic. The off-site traffic characteristics were also deduced from the TIS.

## 3.2 Non-Combustion Particulate Matter Sources

Sources of particulate matter emissions at the site, which are not combustion-related, include:

(1) Dust from MSW and C&D waste tipping and MSW processing and associated rail car loading

(2) Dust from glass processing and associated rail car loading

(3) Dust from vehicle travel on on-site paved roads

(4) Particulate matter in water drift from the cooling towers that serve the biosolids dryers

## 3.3 Odor Sources

MSW and biosolids are sources of different types of odors. MSW odors will be managed at the site in enclosed buildings or in bales, and good air dispersion of the odors will be used to result in de minimis impact. Biosolids odors will be managed using the following add-on odor control devices:

(1) A biofilter with carbon/zeolite polishing, or equal, for the air emanating from the dryers and other process sources within the building; and

(2) Ionization for oxidation of the air constituents emanating from the dewatering operations.

Biosolids building stacks serving the above noted odor control devices have also been designed to further disperse the odor to result in de minimis impact.

## 3.4 Stack Parameters

Stack parameters include the stack height, diameter, location; and the exhaust temperature, flow rate, and velocity. These conceptual design parameters are tabulated and corresponded to their respective sources in **Attachment A**. Stack locations are also shown on a diagram as **Figure A-1**.

# 4.0 EMISSIONS ESTIMATES

Emission units at the proposed facility are categorized as stationary and mobile sources. The stationary source air emission estimates largely relied upon emission factors and methodologies from the USEPA publication AP-42. The mobile source air emission estimates relied upon the USEPA Motor Vehicle Emissions Simulator (MOVES) software/database for mobile source emission factors, USEPA Tier certification emission limits, and an engine specification sheet from Caterpillar and in some cases on the USEPA "SPECIATE" database.

Criteria pollutants, or criteria pollutant precursors, for which emission estimates were prepared are nitrogen oxides ($NO_x$), particulate matter of size 10 microns or less ($PM_{10}$), particulate matter of size 2.5 microns or less ($PM_{2.5}$), carbon monoxide (CO), sulfur dioxide ($SO_2$), and lead (Pb). The emissions for these pollutants were estimated for the following purposes:

(1) Air dispersion modeling for nitrogen dioxide ($NO_2$), CO, $SO_2$, $PM_{10}$ and $PM_{2.5}$;

(2) Analysis of lead as an air toxic compound.

Volatile organic compounds are not included in this analysis for the following reasons:

(1) Specific organic compounds which are subsets of the volatile organic compound (VOC) class of compounds are estimated for the analysis of air toxics impacts;

(2) There is no NAAQS for VOC so air dispersion modeling for this pollutant is not required; and

(3) VOC emissions from the MSW tipping and processing and from the biosolids processing operations are expected to be de minimis relative to air plan application thresholds.

The odor concentration associated with the MSW tipping and processing has been quantified using a published source based on measurements from New York City transfer stations, in conjunction with professional experience. The odor and air toxics concentrations associated with the biosolids processing have primarily been estimated by Hazen & Sawyer during conceptual design of that operation.

Air toxic compounds were selected for emissions estimation based on the MassDEP Ambient Air Toxics Guidelines and based on air toxics measurements at an existing biosolids drying operation. In general, chemicals for which MassDEP has published AALs and TELs, and for which specific emission factors were available, are included in the analysis.

Detailed methods used for the air and odor emission estimation are discussed below and supporting calculations can be found in **Attachment B** to this report.

## 4.1 Biosolids Dryers and Biosolids and Glass Building Heat Sources

The stationary combustion sources at the site are the four biosolids dryers (5 MMBtu/hr each) and space heating sources. The space heating sources were assumed to consist of one biosolids building heat boiler (3 MMBtu/hr), and a number of glass processing building space heaters (3 MMBtu/hr in aggregate). The design capacities are estimated based on expected fuel use provided in a conceptual design by Hazen & Sawyer. Emissions from these stationary combustion sources are estimated using emission factors and the estimated maximum heat input ratings. The fuel source for all five of these sources will be pipeline quality natural gas which is a clean fuel.

The dryer emission factor for $NO_x$, 159 pounds per million standard cubic feet (lb/MMscf) of natural gas fueled, was derived from a Pennsylvania Department of Environmental Protection (PADEP) air permit for a dryer of similar make as is planned for the New Bedford project. The boiler and space heaters emission factor for $NO_x$, 100 lb/MMscf (small, uncontrolled boilers), was sourced from USEPA publication AP-42 "Compilation of Emission Factors" Table 1.4-1 (external combustion sources using natural gas).

The emission factor for $PM_{10}/PM_{2.5}$, 7.6 lb/MMscf of natural gas, was sourced from AP-42 Table 1.4-2 and was applied to both the dryers and the boilers. The emission factor for lead, 0.0005 lb/MMscf of natural gas, was sourced from the same table and applied to all five combustion sources.

The emission factor for $SO_2$, 0.60 lb/MMSCF of natural gas, was sourced from AP-42 Table 1.4-2 and was applied to both the dryers and the boilers.

The emission factors for organic air toxics were sourced from AP-42 Table 1.4-3 and those for metals air toxics were sourced from AP-42 Table 1.4-4. All the air toxics emission factors from AP-42 are stated in units of lb/MMscf.

AP-42 Chapter 1 Section 4 (external combustion sources using natural gas) emission factors are all based on a higher heating value (HHV) of natural gas of 1,020 Btu/scf, which was used for converting the emission factors from lb/MMscf to lb/MMBtu.

Short term emission rates in pounds per hour (lb/hr) and grams per second (g/s) were calculated for the combustion source pollutants. For air dispersion modeling purposes, the four dryers were assumed to operate year-round (8,760 hours per year) at full estimated design capacity. For actual operations, only one to four dryers will be operating at full or part load at any given time. The building heat sources were assumed to only operate during the winter season (December to March) at their max hourly short-term emission rates.

## 4.2 Biosolids Process Sources

The biosolids building also contains non-combustion (process) sources of air and odor emissions. Those sources are controlled before air is exhausted from the building to the atmosphere. The Hazen & Sawyer conceptual design has the biosolids general building ventilation controlled by two (2) ionization units. These units oxidize reduced sulfur compounds to abate the odor strength by a nominal 90% control. Each ionization unit exhausts to its own stack. The Hazen & Sawyer conceptual design for the biosolids drying and processing operations recommended a biofilter for a nominal 90% control of odor from these sources. However, at this stage of design, and upon further consultation with Hazen & Sawyer, it was considered advisable to increase the odor control efficiency to 99% by use of a biofilter with carbon/zeolite polishing, or equal. The air pollution control for the drying and processing operations will exhaust to its own stack.

Odor emission rates from the ionization and scrubber stacks were calculated using the design value for exhaust flow for each of the three stacks, and the associated dilution to threshold (D/T) odor concentration values post-control. The D/T values from the Hazen & Sawyer conceptual design were presented pre-control as well as post-control. For the ionization exhausts the post-control odor concentration was provided. For the dryer and process exhaust, Epsilon used the pre-control odor concentration and applied a 99% control efficiency. Each D/T concentration value was then multiplied by the associated exhaust flow rate (converted to cubic meters per second) to obtain the overall odor units per second (OU/s) emission rate.

The emissions of several air toxics pollutants (hydrogen sulfide, carbonyl sulfide, and ammonia) from the biosolids process stacks were provided by Hazen & Sawyer in concentration units of either parts per million (ppm) or parts per billion (ppb). Pre- and post-control concentrations of these pollutants were provided. Epsilon used the post-control concentrations which assumed ionization control and biofilter control. Epsilon did not take credit for additional control that may be provided by the addition of carbon/zeolite polishing relative to a biofilter, for these three pollutants. Hazen & Sawyer also provided design exhaust flow rates for the biosolids process sources. The concentrations and the exhaust flow rates allow for the calculation of mass emission rates in lb/hr and g/s using the ideal gas law.

Additional air toxics from sludge drying and processing were identified by Hazen & Sawyer, based on dryer exhaust concentrations in parts per billion (ppb) measured at an existing facility. Mass emission rates for these air toxics were scaled up to the Parallel Products design throughput of 50 DTPD and to account for other process emissions aside from the drying operations. Nominal control efficiencies were applied, on a pollutant specific basis, to account for use of a biofilter with carbon (and/or zeolite) polishing, to arrive at the controlled air emission rates in lb/hr and g/s.

For the air and odor dispersion modeling analyses, the biosolids process sources are assumed to operate 8,760 hours per year at full estimated design capacity.

## 4.3 Biosolids Cooling Towers

Cooling towers are a source of $PM_{10}/PM_{2.5}$ air emissions. The current design envisions four (4) small cooling towers that each operate with 900 gallons per minute (gpm) of circulating water. With the drift eliminators specified in the current design, the towers will have a maximum 0.002% drift rate. This drift rate is used to calculate how much water escapes the cooling tower in droplet form.

The cooling tower drift was then multiplied by the density of water to estimate the mass of water escaping the cooling tower cells in droplet form. Each of these droplets has some small amount of particulate dissolved in it which is based on the total dissolved solids (TDS) concentration of the circulating water. In this case, the circulating water was assumed to contain a maximum concentration of 1,800 parts per million by weight (ppmw) of TDS. The total particulate emissions from the cooling tower are estimated by taking this concentration and multiplying it by the mass of water escaping the cooling tower in droplet form.

The total PM emissions are assumed to be entirely made up of $PM_{10}$ such that $PM_{10}=PM$. $PM_{2.5}$ is assumed to make up less than 12% of total particulate matter emissions and as such are equal to the total $PM/PM_{10}$ emissions multiplied by 0.12. These pound per hour $PM_{10}$ and $PM_{2.5}$ emission rates were multiplied by 8,760 hours per year and the total number of cells (4) to obtain the total $PM_{10}$ and $PM_{2.5}$ emissions in tons per year from the cooling towers. The air dispersion modeling analysis is also based on the assumption that the cooling towers all operate every hour year-round. The number of cooling towers actually operating will match the number of dryers operating at any given time.

## 4.4 MSW Tipping and Processing

Operations generating indoor dust emissions from the MSW process can be broken into two subcategories. The first subcategory is material drops and loading operations. Material drop and loading emissions are based on the facility receiving waste 10 hours per day, 7 days per week, on 362 days of the year which equates to approximately 3,620 hours per year of waste receiving. When waste is received, it is dumped or loaded twice. Emissions from loading or dumping were calculated using a methodology set forth in USEPA AP-42 Chapter 13, Section 2.3 pertaining to aggregate handling. Since there were no factors for MSW, all waste is conservatively assumed as the dustier C&D residuals. Based on the volume of the building and assumptions on nominal air changes per hour, a total volumetric flow through the building was determined. Using the known vent exit diameter and the volumetric flow through the building, the air velocity over the MSW was determined, since this value was below the low end of the valid range for the methodology, the low end of the range was used to be conservative. The high end of the valid moisture range for the equation was used since MSW tends to contain significant moisture (>20%). The air velocity, moisture content, and particle size factor (found in AP-42 Chapter 13.2.3) were used to generate an emission factor for $PM_{10}$ and $PM_{2.5}$ in units of pounds of emissions per ton of material processed (lb/ton). This lb/ton emission factor was then multiplied by the average hourly throughput and the number of drops to obtain a lb/hr and g/s emission rate.

The second subcategory is dust emissions from pushing the material around into piles or into a hopper. These emissions were calculated using the equation in USEPA AP-42 Section 13.2.3 for pushing of material. This equation uses the silt content which is the percentage of particles that are less than 75 microns in diameter. The silt content was conservatively assumed to be at the low end of the valid range. The silt content and moisture content are used in the USEPA emission rate equation in conjunction with the appropriate factor from AP-42. AP-42 Table 13.2.3-1 recommends using factors from AP-42 Section 11.9 Table 11.9-1. The resulting lb/hr emissions from the AP-42 equation was then multiplied by the hours per day of operation and then divided by 24 hours per day to get a 24-hr average lb/hr emission value. This process was then repeated for $PM_{2.5}$.

Dust emissions from the first and second subcategories of operations occur inside and were thus grouped together. The total lb/hr emissions of $PM_{10}$ from the indoor activities (drop/dumping actions and pushing of material) were added together. The resulting lb/hr emission rate was multiplied by the hours of operation and converted to tons to obtain a ton per year (tpy) emission rate for the process. This same process was repeated to obtain tpy of $PM_{2.5}$ from the indoor activities.

The odor emissions from the MSW process are generated from the transfer station, during transfer and processing after initial bag break, and the processing building, from organic fines as they move through the process. Initial bag break occurs when an intact plastic bag containing MSW is broken open by the processing equipment. The 50 D/T odor concentration was based on a study of New York City transfer stations as well as other work performed by Epsilon. The total volume through the transfer building was calculated and multiplied by the D/T concentration to get an OU/s emission rate. The OU/s emission rate was then split evenly between the four (4) stacks on the transfer building. The calculations assumed 90% capture for the stacks with 10% of the emissions exiting through the doors on the transfer building. The same general process was used for calculating the OU/s emission rate for the processing building but with a different air flow that is specific to the processing building. The processing building OU/s emission rate was divided evenly amongst the building's three (3) stacks.

The dust and odor emissions from the MSW tipping and handling processes are assumed to occur 8,760 hours per year, for the purposes of air dispersion modeling.

## 4.5 Glass Processing

Glass processing will generate dust. This process has two stationary source subsets associated with it. The first subset is the side bunker area. This includes operations that similarly occur in the north bunker building. The side bunker area consists of inside operations such as using a front loader to load the sorted glass onto the process line conveyor.

The second subset is the north bunker area. The north bunker area consists of indoor emissions from the processing and north bunker building activities and outdoor emissions from the conveyor loading the railcars. The indoor processing includes loading of glass onto conveyors, crushing the glass, dropping the glass into refined sorted piles, and using a front loader to load the sorted glass into a conveyor hopper for train loading... As mentioned above, there is an outdoor source for loading the railcars with glass from the conveyor.

Air emission estimates were calculated for each step using the processing rate of the glass and factors from Table 11.19.2-2 from USEPA AP-42 Chapter 11 Section 19. Emissions from inside buildings were assumed to be controlled by the building at a level of 90%. It was assumed that all emissions generated outdoors are emitted to the atmosphere.

Epsilon notes that the current glass processing emission estimates are conservatively overestimated, based on subsequent process design changes made by Parallel Products. These process design changes include addition of indoor dust collection using a baghouse and multiple pickup points, which will further minimize emissions from this processing operation.

The glass processing is considered to be conducted 8,760 hours per year, for the purposes of air dispersion modeling, except the front-end loader operates 3 hours per day.

## 4.6 Paved Roads

The outdoor emissions related to trucks driving on paved roads have been estimated for the glass, MSW, and biosolids truck traffic on-site. To estimate emissions from the trucks driving on paved roads, equation 1 from USEPA AP-42 Section 13.2.1 was used. This formula uses the road surface silt loading, average weight of vehicles traveling on the road, and a particle size multiplier to determine the emissions associated with the paved roads. The road surface silt loading that was used is from Table 13.2.1-2 for low volume roads (roads with less than 500 average daily trips). The average weight of the trucks was determined by evaluating the weight of each type of truck that enters and leaves the facility and then generating a weighted average based on the number of truck trips per day of each type of truck compared to the total truck trips per day. Using these values, the AP-42 equation generates an emission factor for the roads in grams per vehicle mile traveled.

An estimate of how much distance trucks travel on average when on site was generated based on travel by each truck around a full loop of the facility using the main road that surrounds the facility. Multiplying the emission factor times this vehicle miles traveled value resulted in a pounds per day emission rate of dust from the roads. This pound per day emission rate was then multiplied by 362 days per year and converted to tons to get a tons per year emission rate of dust from the roads. This calculation methodology was performed for both $PM_{10}$ and $PM_{2.5}$ which vary based on the published particle size multiplier. The particle size multipliers are 1.0 for $PM_{10}$ and 0.25 for $PM_{2.5}$.

## 4.7 Mobile Sources

Mobile sources of emissions include on-road truck traffic to and from the site, as well as a small number of off-road heavy construction equipment used in the waste processing.

Process operations are assumed to be continuous, 24 hours per day, seven days per week, for 365 days annually. Therefore, the onsite heavy equipment reflects continuous usage. According to the TIS, truck deliveries are estimated to occur between 5am and 9pm daily.

### *4.7.1 On-site*

Off-road, diesel powered heavy equipment will consist of wheeled front-end loaders used for the glass processing and MSW tipping and processing operations.

The glass processing operation will use two 155-horsepower front end loaders, with each operating for a total of 3 hours per day. This equipment is assumed to be USEPA Tier 4 certified for emissions estimation purposes.

The MSW tipping and processing operation includes two 267-horsepower loaders. These are assumed to operate together for 16 hours per day (while MSW receiving is occurring), and one will operate alone for 8 hours per day (during the night shift to continuously feed the processing equipment), for a total of 40 hours of operating time per day. These are expected to be new units, equipped with USPEA Tier 4 certified engines with emissions controls as necessary to meet the certification standards.

Emission factors for the front-end loaders were obtained from the NONROAD model included within USEPA's MOVES software or regulatory Tier certification emission limits. USEPA's SPECIATE database was used to estimate the breakdown of individual hazardous air pollutants from the total organic gases where available. Formaldehyde emissions were based on a USEPA's MOVES emission factor and on a Caterpillar engine emissions specification sheet for a similarly sized Tier 4 engine, and the emissions were scaled to the project size.

Within the facility property, on-road mobile sources include the truck traffic moving along the ring roadway, as well as trucks idling at the inbound and outbound scales and at two stopping points along the road. It is assumed that the trucks idle for a total of 2 minutes at each of the stopping points.

It was assumed all trucks were heavy duty diesel, and that the speeds along the ring roadway were limited to 15 miles per hour. A speed of 5 miles per hour was assumed for trucks making their way from the inbound scale to the tipping area and then back to the outbound scale.

Emission factors were obtained using the MOVES software using a presumed build-out year of 2025.

### *4.7.2 Off-site*

Outside of the property, emissions from truck traffic were analyzed out to the intersections of local roads with Massachusetts State Route 140 ramps, with a number of stopping points, representing idling at local intersections.

Based on the TIS, 19 peak truck trips per hour were assumed. The revised study assumes 100% of the truck traffic comes from the north, towards Rice Boulevard/Braley Road and Route 140. Truck speeds of 25 mph were assumed for these local roads, and 15 mph on the on- and off-ramps to Route 140.

It was assumed that trucks would idle at local intersections due to regular traffic patterns. The intersections included were:

- Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road
- Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road
- Phillips Road & Theodore Rice Boulevard/Braley Road
- Duchaine Boulevard & Theodore Rice Boulevard
- Duchaine Boulevard & Samuel Barnet Boulevard

Idle times at each of these intersections were determined from traffic modeling using the SYNCHRO program. This program incorporates vehicle volumes, control (signal or "stop" sign), lane configuration, and other variables to estimate intersection Level of Service (LOS), and average vehicle delay times. These delay times were used to estimate the amount of time trucks idle at each intersection. Idle emissions were then calculated from this idle time, and emission factors from the MOVES model for heavy duty diesel trucks at a speed of 0 mph.

# 5.0 REGULATORY APPLICABILITY

This section describes the regulatory standards and their applicability to the proposed Project. For each air regulatory program listed in **Table 5-1** below, there is a section briefly explaining why the standard does or does not apply.

**Table 5-1 Summary of Applicable Requirements**

| Regulatory Program | Applicability |
|---|---|
| Ambient Air Quality Standards and Policies | Apply and are satisfied as described in Section 5.1 and Section 6.0 |
| Prevention of Significant Deterioration (PSD) Review | Not Applicable, See Section 5.2 |
| Non-Attainment New Source Review (NSR) | Not Applicable, See Section 5.3 |
| New Source Performance Standards (NSPS) | Not Applicable, See Section 5.4 |
| National Emission Standards for Hazardous Air Pollutants (NESHAPs) | Not Applicable, See Section 5.5 |
| Emissions Trading Programs | Not Applicable, See Section 5.6 |
| Visible Emissions | Applies and is satisfied as described in Section 5.7 |
| Noise Control Regulation and Policy | Applies and is satisfied as described in Section 5.8 |
| Industry Performance Standards | Not Applicable, See Section 5.9 |
| Air Plan Approval | May apply and is satisfied as described in Section 5.10 |
| Best Available Control Technology (BACT) | Applies and is satisfied as described in Section 5.11 |
| Operating Permit and Compliance Assurance Monitoring (CAM) | Not Applicable, See Section 5.12 |
| Massachusetts Environmental Policy Act (MEPA) | Applies and is satisfied as described in Section 5.13 |
| Massachusetts Air Toxics Guidelines | Apply and are satisfied as described in Section 5.14 |

## 5.1 Ambient Air Quality Standards and Policies

One of the most basic goals set forth in the federal and state air regulations is to ensure that ambient air quality, including the impact of background, existing sources, and new sources, complies with ambient air quality standards. As such, all areas of the country are labeled with one of three classifications for each particular contaminant. These three classifications are “attainment,” “nonattainment,” and “unclassified.”

In areas designated as attainment, the air quality with respect to the pollutant is equal to or better than the NAAQS. These areas are under a mandate to maintain, i.e., prevent significant deterioration of, such air quality. In areas designated as unclassifiable, there is limited air quality data, and those areas are treated as attainment areas for regulatory purposes. In areas designated as nonattainment, the air quality with respect to the pollutant is worse than the NAAQS. These areas must take actions to improve air quality and attain the NAAQS within a certain period of time.

Part of documenting compliance with Massachusetts air regulations is to document that new emission sources associated with the project do not cause or contribute to an exceedance of the air quality standards set forth by the State and Federal regulations. The USEPA has developed a set of NAAQS for six air contaminants that are collectively known as criteria pollutants. These NAAQS are intended to protect public health and welfare. The six criteria pollutants are sulfur dioxide ($SO_2$); particulate matter (which is broken up into two categories: $PM_{10}$ which is particulate having an aerodynamic diameter of 10 micrometers or less, and $PM_{2.5}$ which is particulate matter having an aerodynamic diameter of 2.5 micrometers or less); nitrogen dioxide ($NO_2$); carbon monoxide (CO); ozone ($O_3$); and lead (Pb). Coinciding with the NAAQS, the Commonwealth of Massachusetts has set forth its own state air quality standards called the Massachusetts Ambient Air Quality Standards (MAAQS) which are codified in 310 CMR 6.00. These MAAQS have recently been updated to reflect the more recent USEPA updates to the NAAQS. This update has removed the Annual $PM_{10}$ standard and the 24-hour and Annual $SO_2$ standards which were revoked in the NAAQS in 2006 and 2010, respectively, from the MAAQS. In this report, the term "NAAQS" will refer to both sets of standards.

The NAAQS have been developed for various durations of exposure. The short-term standards typically refer to pollutant levels that are not to be exceeded except for a limited number of times per year. The long-term standards typically refer to pollutant levels that are not to be exceeded on an annual average basis. These standards can be further broken down into primary and secondary standards. Primary standards are intended to protect human health, including the health of "sensitive" populations such as asthmatics, children and the elderly. The secondary standards are intended to provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

The NAAQS for criteria pollutants are shown in Table **5-2** below.

## Table 5-2 National Ambient Air Quality Standards (NAAQS)

| Pollutant | Averaging Period | NAAQS ($\mu g/m^3$) | |
|---|---|---|---|
| | | Primary | Secondary |
| CO | 1-Hour | 40,000[1] | Same |
| | 8-Hour | 10,000[1] | Same |
| Pb | Rolling 3-month avg. | 0.15[2] | Same |
| $NO_2$ | 1-Hour | 188[3] | None |
| | Annual | 100[4] | Same |
| $O_3$ | 8-Hour | 137.4[5] | Same |
| $PM_{2.5}$ | 24-Hour | 35[6] | Same |
| | Annual | 12[7] | 15[7] |
| $PM_{10}$[9] | 24-Hour | 150[1] | Same |
| $SO_2$[10] | 1-Hour | 195.0[8] | None |
| | 3-Hour | None | 1,310[1] |

[1] Not to be exceeded more than once per year
[2] Not to be exceeded
[3] 98th percentile of 1-hour daily maximum concentrations averaged over 3 years
[4] Annual mean
[5] Annual fourth-highest daily maximum ozone concentration, averaged over 3 years
[6] 98th percentile, averaged over 3 years
[7] Annual mean, averaged over 3 years
[8] 99th percentile of 1-hour daily maximum concentrations averaged over 3 years
[9] The Annual $PM_{10}$ standard was revoked in 2006.
[10] The 24-hour and Annual $SO_2$ standards were revoked in 2010.

An air quality impact analysis was performed for the new sources associated with this project to document compliance with the ambient air quality standards as well as the air toxics guidance (discussed in detail in Section 5.15). This air quality impact analysis is further discussed in Section 6.0 of this document.

## 5.2 Prevention of Significant Deterioration (PSD) Review

The PSD new source review program is a federally-mandated program review of new major stationary sources of criteria pollutants designed to maintain the NAAQS and prevent degradation of air quality in attainment/unclassifiable areas. The PSD program, which is implemented by the Massachusetts Department of Environmental Protection (MassDEP) in Massachusetts[3], applies to new major stationary sources and major modifications of existing major sources of air pollution in attainment/unclassifiable areas. The Facility is not an existing major source under PSD regulations and the new potential emissions from the stationary sources at the project do not exceed the applicable PSD major source emissions threshold of 250 tpy.

[3] MassDEP administers the federal PSD program in accordance with the provisions of the April 11, 2011 PSD Delegation Agreement between MassDEP and EPA which states that MassDEP agrees to implement and enforce the federal PSD regulations as found in 40 CFR 52.21.

## 5.3 Non-Attainment New Source Review

If a major source of pollution is proposed in an area designated as nonattainment for a particular pollutant, the source is subject to Nonattainment New Source Review (NSR) for that pollutant. The federal Clean Air Act defines levels of nonattainment classifications for ozone (“$O_3$”). The entire Commonwealth of Massachusetts was previously classified as moderate nonattainment for 8-hour ozone. MassDEP has not taken any action to revise its Nonattainment NSR provisions as a result of the recent reclassification of most of the state to “unclassifiable/attainment” for 8-hr ozone. Therefore, the Nonattainment NSR provisions of MassDEP regulations at 310 CMR 7.00 Appendix A (“Appendix A”) are still currently applicable state-wide to major sources of $NO_x$ and VOC, as precursors to ozone.

The major source threshold for $NO_x$ and VOC is currently 50 tpy in Massachusetts. The Non-Attainment NSR regulations do not apply to this project because the aggregate potential emissions from the proposed stationary sources at the facility are below the 50 tpy threshold for $NO_x$ and the 50 tpy threshold for VOC.

## 5.4 New Source Performance Standards

The USEPA has implemented New Source Performance Standards (NSPS) at 40 CFR 60. These NSPS are intended to regulate air contaminants that may be emitted by various categories of newly constructed industrial or commercial equipment. None of the emission sources at the proposed facility fall into the categories and definitions of applicability in any of the established NSPS requirements. As such, the Facility is not subject to the requirements of any NSPS.

## 5.5 National Emission Standards for Hazardous Air Pollutants

Realizing that there were many pollutants that did not meet the specific requirements for developing a NAAQS, Congress included a section (Section 112) in the 1990 Amendments to the Clean Air Act that established a vehicle for the USEPA to develop air quality standards for potentially hazardous pollutants. Updates to regulations set forth in 40 CFR 61 and new regulations published in 40 CFR 63 were developed to implement Section 112 of the 1990 Amendments to the Clean Air Act. The regulations at 40 CFR 61 apply to specific pollutants and source categories that do not include the proposed facility. 40 CFR 63 established numerous National Emission Standards for Hazardous Air Pollutants (NESHAPs) to regulate Hazardous Air Pollutants (HAPs). HAPs refers to specified pollutants regulated under the Clean Air Act, including organic compounds and trace metals for which the USEPA has not established ambient air quality standards. HAPs are defined in detail within 42 U.S.C. 7412, and accompanying regulations in 40 CFR Part 63, Subpart C. There are no NESHAP requirements that are applicable to the facility as proposed.

## 5.6 Emissions Trading Programs

The Acid Rain Program (40 CFR 72), the Regional Greenhouse Gas Initiative (RGGI), and the Massachusetts $NO_x$ Budget program apply to fossil fuel-fired combustion devices serving a generator with a nameplate capacity of greater than 25 MWe. This proposed facility does not include any fossil fuel-fired combustion devices serving a generator larger than 25 MWe, thus these three programs do not apply.

## 5.7 Visible Emissions

Massachusetts regulation (310 CMR 7.06) limits smoke to No. 1 on the Ringlemann Chart (except for six minutes in an hour up to No. 2 on the Chart) and limits opacity to 20% (except for two minutes in an hour up to 40%). These limits apply to stationary sources. The proposed facility is not expected to have any visible emissions impact from stationary sources and is expected to operate well below the visible emissions limits set forth in 310 CMR 7.06.

## 5.8 Noise Control Regulation and Policy

MassDEP regulations, set forth in 310 CMR 7.10 and as interpreted in the MassDEP Noise Policy 90-001, limit noise increases to 10 dBA over the existing $L_{90}$ ambient level at the closest residence and at property lines. Conforms to the Noise Control Regulations and Policy are discussed in the DEIR.

## 5.9 Industry Performance Standards

Commercial, industrial, and institutional boilers have a compliance certification option, in lieu of air permitting, under the Massachusetts Environmental Results Program (ERP). This certification is required for boilers rated between 10 and 40 MMBtu/hr, if a project will not obtain a site-specific air plan approval for the source instead. The four (4) dryers and the boiler in the biosolids building and the space heaters in the glass processing buildings are exempt from this certification as they are below the threshold for inclusion in the program at 5 MMBtu/hr each and 3 MMBtu/hr respectively.

## 5.10 Air Plan Approval

The proposed Facility may be subject to MassDEP air plan approval (air permitting) requirements under 310 CMR 7.02. Key standards for approval are listed in 310 CMR 7.02 (4) for Limited Plan Approvals and 310 CMR 7.02 (5) for Comprehensive Plan Approvals. These standards typically include ensuring that these new stationary sources will be in compliance with all applicable federal and MassDEP air regulatory requirements, ensuring that the new sources will meet ambient air quality criteria, and requiring a certification that any facilities in Massachusetts owned or operated the applicant are in compliance with MassDEP air requirements (or are on an approved schedule to come into compliance). The proposed facility is may be subject to the MassDEP air plan approval requirements for a

Limited Plan Application (LPA) and, if applicable, will comply by filing the necessary documents and forms with MassDEP through the MassDEP/EEA ePLACE Portal. The LPA applicability threshold is one (1) tpy of any regulated pollutant, whereas the non-major Comprehensive Plan Application (nmCPA) applicability threshold is ten (10) tpy of any regulated pollutant.

The four (4) dryers and the boiler in the biosolids building are exempt from the air plan approval process as they are each rated below the 10 MMBtu/hr threshold for inclusion in the program. The cooling towers will comply with the listed exemption in 310 CMR 7.02(2)(b)6. The exemption applies to cooling towers with a maximum recirculation rate of 20,000 gpm (the current project design is 900 gpm) and requires the use of a drift eliminator, a non-chromium inhibitor, and enough of a bleed stream to limit the total dissolved solids (TDS) concentration in the recirculating water to 1,800 milligrams per liter (mg/L).

The entire project may, instead of being subject to the plan approval process, be deemed by MassDEP to be a de minimis source. This is because the emissions of each individual air pollutant from the stationary, non-combustion processes and sources, after addition of controls, will likely be below the plan approval threshold of one (1) ton per year. In this case the facility will be required by MassDEP to document de minimis status in writing and track actual emissions on a rolling 12-month basis to demonstrate ongoing de minimis status.

In addition to the federal and state limits and standards described above which are implemented through the MassDEP Air Plan Approval review, Massachusetts regulations require the application of Best Available Control Technology (BACT) for each regulated pollutant as discussed in Section 5.11 of this document. Application of BACT is reviewed by MassDEP during the air plan approval review process for stationary sources subject to that process.

## 5.11 Best Available Control Technology

Massachusetts BACT is based on the maximum degree of reduction of any regulated air contaminant that the MassDEP determines, on a case-by-case basis, is achievable taking into account energy, environmental, and economic impacts. A BACT determination can never result in a less stringent emission limitation than an applicable emission standard. Depending on the circumstances, BACT may parallel with the emission standard or may be more stringent than the emission standard. BACT itself is a standard that balances emission control benefits with technical feasibility, other environmental impacts, and costs. BACT for stationary sources subject to the MassDEP air plan approval process is addressed by the applicant in an air plan application.

## 5.12 Operating Permit and Compliance Assurance Monitoring

The proposed facility will not be subject to the requirements to obtain an operating permit as it is not a major source of emissions and no Federal regulations apply that require obtaining an operating permit (i.e., certain NSPS and NESHAP).

The Compliance Assurance Monitoring (CAM) requirements at 40 CFR 64 apply when an emission unit uses a control device to comply with certain emission limits, the potential emissions before control are above major source thresholds, and an operating permit does not specify a continuous compliance determination method, such as CEMS. No such sources exist at this facility and the proposed facility will not be required to obtain an operating permit; therefore, CAM does not apply.

## 5.13 Massachusetts Environmental Policy Act

The Massachusetts air plan approval regulations at 310 CMR 7.02 state that Massachusetts Environmental Policy Act (MEPA) requirements must be complied with before obtaining a plan approval. Per the MEPA Office website, MEPA requires that state agencies study the environmental consequences of their actions, including permitting and financial assistance. It also requires them to take all feasible measures to avoid, minimize, and mitigate damage to the environment.

MEPA further requires that state agencies "use all practicable means and measures to minimize damage to the environment," by studying alternatives to the proposed facility, and developing enforceable mitigation commitments, which will become conditions for the project if and when they are permitted. The project EENF, DEIR, and Final Environmental Impact Report (FEIR) have served, and will serve, as the MEPA compliance filings for the proposed facility.

## 5.14 Massachusetts Air Toxics Guidelines

Similar to the NAAQS discussed in Section 5.1, there are concentration thresholds for air toxics that are in place to protect air quality and human health. MassDEP has set forth guideline values known as the AALs and TELs to allow evaluation of the potential for human health risks associated with exposure from certain chemicals in the air.

MassDEP determines the AALs and TELS through an analysis of health effects. The first step in developing an AAL and TEL is to look at the carcinogenic and non-carcinogenic health effects of the chemicals.

Known or suspected carcinogenic health effects make up the basis of the Non-Threshold Effects Exposure Limits (NTELs) which are associated with a one in a million excess cancer risk over a lifetime of continuous exposure to the chemical.

The TEL addresses the non-cancer health effects and is intended to protect the general population from adverse health effects over a lifetime of exposure to the chemical. The TEL includes impacts on sensitive populations such as children and takes into account other pathways for exposure to the chemical than just ambient air. These other pathways that are evaluated in the TEL determination include indoor air, food, soil, and water.

MassDEP then compares the NTEL and TEL and assigns whichever concentration is lower as the AAL to make sure both cancer and non-cancer health impacts are mitigated to the fullest extent possible. Most AALs are based on the NTELs since the NTEL tends to be lower than the TEL for most compounds. For non-carcinogenic compounds, the AAL will be based on the TEL which results in the published AAL and TEL values being the same. It is important to note that exposure above an AAL or TEL does not necessarily mean there will be adverse health impacts, but rather that the risk of these adverse effects increases with the frequency of exposure above these levels.

In some cases, MassDEP did not have an AAL or TEL for a particular chemical. In these cases, the USEPA Integrated Risk Information System (IRIS) was reviewed for that chemical to determine if a reference concentration (RFC) existed. The reference concentration is derived in a similar manner as the AAL and TEL concentrations and represents a concentration protective of the general population and sensitive subpopulations.

To address the air toxics guidelines, air toxic mass emission rates were estimated for both stationary and mobile sources at the proposed facility, ambient concentrations from all sources were modeled, and the maximum modeled concentrations were compared to the AAL (on an annual average basis) and TEL (on a short-term basis), or the RFC, to ensure there are no exceedances in the residential neighborhoods. In some cases, AALs and TELs were not available for pollutants of concern, and in those cases the RFC was used for comparison. The results of the air toxics analysis that contains the comparison to these AALs and TELs (and RFCs as appropriate) is found in Section 6.3 and Attachment D of this report.

# 6.0 AIR QUALITY IMPACTS ANALYSES & RESULTS

## 6.1 General Approach

As part of the environmental impact analysis for the proposed project, an air quality analysis has been completed to estimate the impacts of air pollutants on the nearby residential areas.

### *6.1.1 Modeling Methodology*

To predict potential project-generated air quality impacts at nearby locations, USEPA has developed computer software to emulate or "model" dispersion of chemicals in the atmosphere. These models incorporate pollutant source characteristics, local meteorological data, digital location and terrain data, and a variety of control options to estimate pollutant concentrations at a given location. This technique is often required for sources of air pollution and the acceptable and appropriate methods are specified in detail in both USEPA regulations[4] and state modeling guidelines.[5]

The models and air quality modeling techniques are developed with a relatively highly conservative margin of error, such that results are generally shown to be higher or worse than actual atmospheric dispersion. This provides reasonable confidence that by showing compliance with applicable standards, that protection of public health and welfare is assured.

### *6.1.2 Air Quality Model Selection and Options*

The USEPA's AERMOD model (Version 18081) was selected to predict concentrations from the stationary source related to the proposed project. AERMOD is the USEPA's preferred model for regulatory applications. The use of AERMOD provides the benefits of using the most current algorithms available for steady state dispersion modeling.

The AERMOD View graphical user interface (GUI) Version 9.7.0, created by Lakes Environmental, was used to facilitate model setup and post-processing of data. The AERMOD model was selected for this analysis because it:

- is the required USEPA model for all refined regulatory analyses for receptors within 50 km of a source;
- is a refined model for facilities with multiple sources, source types, and building-induced downwash;

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4 40 CFR Part 51, Appendix W. Guideline on Air Quality Models

5 MassDEP, 2011: Modeling Guidance For Significant Stationary Sources Of Air Pollution, Massachusetts Department of Environmental Protection, Boston, MA 02108

- uses actual representative hourly meteorological data;
- incorporates direction-specific building parameters which can be used to predict impacts within the wake region of nearby structures;
- allows the modeling of multiple sources together to predict cumulative downwind impacts, if needed;
- provides for variable emission rates (though not applicable for this evaluation);
- provides options to select multiple averaging periods between one-hour and one year (scaling factors can be applied to adjust the one-hour impact to a peak impact less than one-hour); and,
- allows the use of large Cartesian and polar receptor grids, as well as discrete receptor locations.

Modeling was performed with all regulatory options set. Regulatory default options adopted for the model include:

- Use stack-tip downwash (except for building downwash). Stack-tip downwash is an adjustment of the actual stack release height for conditions when the gas exit velocity is less than 1.5 times the wind speed. For these conditions, the effective release height is reduced a bit, based on the diameter of the stack and the wind and gas exit velocity. This option applies to point sources only, such as stacks and vents.

- Use the missing data and calms processing routines. The model treats missing meteorological data in the same way as the calms processing routine, i.e., it sets the concentration values to zero for that hour and calculates the short-term averages according to USEPA's calms policy, as set forth in the Guideline on Air Quality Models (Appendix W to 40 CFR 51).

A complete description of the AERMOD dispersion model may be found in the AERMOD User's guide[6] and the AERMOD model implementation guide.[7]

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[6] USEPA, 2016: User's Guide for the AMS/EPA Regulatory Model – AERMOD. EPA-454/B-16-011. U.S. Environmental Protection Agency, Research Triangle Park, NC 27711.

[7] USEPA, 2016: AERMOD Implementation Guide. EPA-454/B-16-013. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711.

### *6.1.3 Urban / Rural Analysis*

The AERMOD model can assign sources to a rural or urban category to allow specified urban sources to use the effects of increased surface heating under stable atmospheric conditions. The **rural** dispersion classification was selected based on a visual inspection of the area within a three-kilometer radius of the proposed project site. The area within 3 km of the site is shown in **Figure 3**.

### *6.1.4 Background Air Quality Data*

Ambient background concentrations (also known as "design values") are added to the source impacts to obtain total concentrations, which, in turn, are compared to the NAAQS and MAAQS.

The Clean Air Act and USEPA's authority to promulgate the NAAQS determine the statistical forms of the standards. These dictate exactly how the ambient monitored concentrations reflect an area's compliance with the NAAQS, as well as how a conducted air quality impact analysis complies with the NAAQS.

To attain the 24-hour $PM_{2.5}$ standard, the three-year average of the 98th percentile of 24-hour concentrations must not exceed 35 $\mu g/m^3$. For annual $PM_{2.5}$ averages, the three-year average of the highest annual observations must not exceed 12 $\mu g/m^3$. To attain the one-hour $NO_2$ standard, the three-year average of the 98th percentile of the maximum daily one-hour concentrations must not exceed 188 $\mu g/m^3$. The Annual $NO_2$ NAAQS of 100 $\mu g/m^3$ is never to be exceeded.

Background concentrations were determined from the closest and most representative available monitoring stations to the project. The closest monitor is at 659 Globe Street in Fall River, and this location samples $SO_2$ and $PM_{2.5}$. The next closest monitor is at Francis School in East Providence, RI, and this location samples for CO and $NO_2$. Finally, the closest monitor of $PM_{10}$ is at the Urban League Building in Providence, RI. Monitor values were obtained from MassDEP Annual Air Quality Reports (2015-2017) and USEPA tabulated annual summary data of monitor concentrations available on their AIRDATA website (https://aqs.epa.gov/aqsweb/airdata/download_files.html#Annual). Although USEPA "design values" are published, they were found to be slightly lower than the calculated background values. Therefore, the calculated background values are conservatively used. The values are presented in **Table 6-1.**

## Table 6-1 Background Concentrations

| Pollutant | Avg. Time | Form | 2015 | 2016 | 2017 | Background Concentration ($\mu g/m^3$) | NAAQS | Percent of NAAQS |
|---|---|---|---|---|---|---|---|---|
| $SO_2$ (1)(5) | 1-Hr (4) | 99th % | 25.9 | 18.3 | 29.3 | 24.5 | 196.0 | 13% |
| | 3-Hr | H2H | 21.7 | 13.1 | 23.3 | 23.3 | 1300.0 | 2% |
| $PM_{10}$ | 24-Hr | H2H | 33 | 21 | 26 | 33.0 | 150.0 | 22% |
| $PM_{2.5}$ | 24-Hr (4) | 98th % | 21.7 | 14.3 | 16.5 | 17.5 | 35.0 | 50% |
| | Ann. (4) | H | 7.1 | 5.3 | 6.8 | 6.4 | 12.0 | 53% |
| $NO_2$ (3) | 1-Hr (4) | 98th % | 79.5 | 67.3 | 74.1 | 73.6 | 188.0 | 39% |
| | Ann. | H | 14.4 | 12.5 | 12.3 | 14.4 | 100.0 | 14% |
| CO (2) | 1-Hr | H2H | 2005.5 | 1547.1 | 1501.3 | 2005.5 | 40000.0 | 5% |
| | 8-Hr | H2H | 1260.6 | 1031.4 | 1031.4 | 1260.6 | 10000.0 | 13% |

Notes:

From MassDEP Air Quality Reports and EPA's Airdata Website

(1) $SO_2$ reported ppb. Converted to $\mu g/m^3$ using factor of 1 ppm = 2.62 $\mu g/m^3$.

(2) CO reported in ppm. Converted to $\mu g/m^3$ using factor of 1 ppm = 1146 $\mu g/m^3$.

(3) $NO_2$ reported in ppb. Converted to $\mu g/m^3$ using factor of 1 ppm = 1.88 $\mu g/m^3$.

(4) Background level is the average concentration of the three years.

(5) The 24-hour and Annual standards were revoked by U.S. EPA on June 22, 2010, Federal Register 75-119, p. 35520.

In 2010 the USEPA finalized and promulgated new 1-hour NAAQS for $NO_2$. There have been several clarification memos released by USEPA regarding application of Appendix W modeling guidance for the new 1-hour standards. On March 1, 2011, USEPA released a memo recommending for $NO_2$, to use the latest three (3) year average background values that were calculated based on season and hour day.[8]

The ambient monitored $NO_2$ data were obtained from the USEPA[9] for the Francis School, Rockefeller Library and Hayes Road monitors. The data were obtained and processed I accordance with MassDEP and USEPA procedures. The seasonal-hourly background concentrations used in the $NO_2$ modeling are presented in **Table 6-2**.

8 USEPA, 2011; Memorandum - Additional Clarification Regarding Application of Appendix W Modeling Guidance for the $NO_2$ National Ambient Air Quality Standard. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711. March 1, 2011.

9 https://aqs.epa.gov/aqsweb/airdata/download_files.html#Raw

## Table 6-2 $NO_2$ Background Concentrations by Season and Hour

| Hour | Value (ppb) | Hour | Value (ppb) | Hour | Value (ppb) | Hour | Value (ppb) | Hour | Value (ppb) | Hour | Value (ppb) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WINTER | | | | | | | | | | | |
| 1 | 30.90 | 2 | 31.30 | 3 | 32.00 | 4 | 31.70 | 5 | 33.70 | 6 | 33.80 |
| 7 | 35.70 | 8 | 34.60 | 9 | 33.00 | 10 | 30.60 | 11 | 23.90 | 12 | 20.30 |
| 13 | 19.40 | 14 | 19.30 | 15 | 19.30 | 16 | 20.70 | 17 | 20.00 | 18 | 26.10 |
| 19 | 29.20 | 20 | 29.40 | 21 | 31.90 | 22 | 34.00 | 23 | 32.90 | 24 | 32.60 |
| SPRING | | | | | | | | | | | |
| 1 | 27.20 | 2 | 27.60 | 3 | 27.70 | 4 | 29.80 | 5 | 31.20 | 6 | 33.50 |
| 7 | 33.40 | 8 | 28.70 | 9 | 19.60 | 10 | 16.70 | 11 | 16.70 | 12 | 16.70 |
| 13 | 16.70 | 14 | 16.70 | 15 | 16.70 | 16 | 16.70 | 17 | 16.70 | 18 | 16.70 |
| 19 | 16.70 | 20 | 17.80 | 21 | 18.30 | 22 | 20.20 | 23 | 22.90 | 24 | 23.20 |
| SUMMER | | | | | | | | | | | |
| 1 | 16.70 | 2 | 16.70 | 3 | 16.70 | 4 | 16.70 | 5 | 16.70 | 6 | 16.70 |
| 7 | 16.70 | 8 | 16.70 | 9 | 16.70 | 10 | 16.70 | 11 | 16.70 | 12 | 16.70 |
| 13 | 16.70 | 14 | 16.70 | 15 | 16.70 | 16 | 16.70 | 17 | 16.70 | 18 | 16.70 |
| 19 | 16.70 | 20 | 16.70 | 21 | 16.70 | 22 | 16.70 | 23 | 16.70 | 24 | 16.70 |
| FALL | | | | | | | | | | | |
| 1 | 22.90 | 2 | 22.70 | 3 | 21.20 | 4 | 20.10 | 5 | 20.10 | 6 | 21.40 |
| 7 | 21.90 | 8 | 24.50 | 9 | 24.00 | 10 | 20.10 | 11 | 16.70 | 12 | 16.70 |
| 13 | 16.70 | 14 | 16.70 | 15 | 16.70 | 16 | 16.70 | 17 | 16.70 | 18 | 17.80 |
| 19 | 21.50 | 20 | 23.10 | 21 | 25.00 | 22 | 24.50 | 23 | 23.30 | 24 | 23.30 |

### *6.1.5 Meteorological Data for Modeling*

Five years (2013-2017) of meteorological data were used in the analysis. Surface data from New Bedford Regional Airport which is the closest and most representative meteorological station (located approximately 2.7 miles south of the proposed project) and upper air sounding data from Chatham, MA have been processed into AERMOD-ready input files using version 18081 of AERMET. Based on direction from MassDEP, the U-star adjustment was used.[10] Raw 1-minute data were included using version 15272 of the AERMINUTE preprocessor to reduce the incidence of "calm" winds. A 0.5 m/s calm wind threshold was input.

AERSURFACE (version 13016) processes digital land cover data to determine the surface characteristics for use in AERMET. These parameters include surface roughness, albedo, and Bowen ratio. Based on the climatological record for New Bedford from 1996 to 2017

[10] Personal communication, Epsilon Associates, Inc. (Joseph Sabato) and MassDEP (Glenn Pacheco), November 10, 2017.

annual precipitation data, 2015, 2016, and 2017 are considered dry, while 2013 is average and 2014 is wet. If the total precipitation was between the 30th and 70th percentile it was considered “average”, if it was less than 30th percentile "dry" and if it was greater than 70th percentile, “wet”. Other options include the use of the Modify Option for the Upper Air Soundings and inputs of a base elevation of 24 meters and an anemometer height of 7.92 meters.

Continuous snow cover was determined from data downloaded from the National Operational Hydrologic Remote Sensing Center Interactive Snow Information Website (http://www.nohrsc.noaa.gov/interactive/html/graph.html). These annual datasets contain both observed and modeled snow depths for every hour of a year at a prescribed location. For New Bedford Regional Airport, only modeled data are available. The number of hours of modeled snow depth greater than zero was calculated for each month. The following rules were applied:

- Any month having greater than 1 inch of snow cover for greater than 60% of the hours was considered having “Continuous Snow Cover”
- April and May are always considered “Transitional Spring”
- June/July/August are always considered “Midsummer”
- September and October are always considered “Autumn”
- November through March without snow cover is considered “Late Autumn/Winter Without Continuous Snow Cover”

The results of the precipitation analysis and snow cover analysis are presented in **Attachment C** to this report.

Testing of the processed meteorological data found that the five-year period of 43,824 total hours, 514 calm hours were identified, and 387 (0.88%) missing hours were identified. Thus, these data should be deemed complete and representative for air quality modeling of the proposed project site. Winds are generally out of the west-northwest and southwest.

A wind rose showing the distribution of wind speed and direction is presented in **Figure 4**.

### *6.1.6 Receptors*

A total of 6,499 receptors were modeled. Of this total, 6,496 are in an 11 km by 11 km nested grid encompassing 121 square kilometers and extending roughly 5.5 kilometers in cardinal directions from the facility. The grid consists of a 1 km by 1 km bounding box with 20-meter spacing to encompass the neighborhood to the east of project site. The remaining receptors are defined by the following receptor distance and density:

| Distance from Bounding Box (m) | Receptor Spacing (m) |
|---|---|
| 200 | 20 |
| 500 | 50 |
| 1000 | 100 |
| 2000 | 200 |
| 5000 | 500 |

It is expected that with low release temperatures low exit velocities, and downwash influences, maximum impacts would be relatively close to the facility. The 20-meter receptor spacing locates a receptor at practically every house in the neighborhood to the east.

Receptors within the facility property were removed. USEPA recently issued draft guidance redefining “ambient air”. A physical barrier (fence) is no longer required and USEPA is proposing that non-physical “measures” (signage, surveillance, natural obstructions) may be adequate to prevent the general public from accessing “ambient air” on private property. It is assumed that the facility will take appropriate measures to limit access to the property.

Four “sensitive” receptor locations were also included. A discrete receptor was placed at each of the following locations: the Casimir Pulaski Elementary School on Braley Road, the Elwyn G Campbell Elementary School on Essex Street, and the Creative Playschool on Acushnet Avenue. A grid receptor located adjacent to the Northstar Learning Center on Samuel Barnet Boulevard was used to represent that location.

Receptor locations are shown in **Figure 5**.

Receptor terrain elevations were included in the refined analysis, as is required for regulatory refined modeling. One-third arc-second terrain data were obtained from the U.S.G.S National Map Seamless Server according to guidance set forth by USEPA.[11] Source, building, and receptor elevations are processed using the AERMAP (version 18081) processor by way of the Lakes AERMOD View interface.

#### *6.1.7 Good Engineering Practice Stack Height Determination*

AERMOD requires direction specific building parameters to adequately incorporate the aerodynamic effects of buildings on plume dispersion. The most recent version (04274) of the Building Profile Input Program with the Prime downwash algorithms (BPIP-Prime) is

[11] USEPA, 2009: AERMOD Implementation Guide. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711.

used to calculate these parameters. BPIP-Prime uses the stack information, as well as the height information of nearby buildings to calculate the required heights, widths, and setbacks required to account for building downwash.

The property will consist of a number of buildings and structures. Given the locations of the stacks, they are probable to be subject to aerodynamic influences that would affect the dispersion of the stack exhaust. Thus, the proposed MSW tipping and existing MSW processing buildings, the proposed biosolids building, the proposed glass processing building, the proposed solar canopies, and the industrial building to the south of the property were input into the BPIP Prime program to create direction-specific dimension inputs for the AERMOD model. Most building tier heights were provided. Other heights were conservatively estimated. Other nearby buildings (i.e., residences) were determined to be at a distance where they would not affect dispersion. Building tiers are shown in **Figure 6**.

#### *6.1.8 Selection of Sources to Include in Analyses*

On-site stationary and heavy mobile equipment sources, and truck traffic both on-site and off-site, were included in the analysis. This represents a broader inclusion of sources than is typically considered in a MassDEP air plan application air dispersion modeling analysis. For air permitting purposes, only air emissions from stationary sources, such as the biosolids process and combustion sources, the MSW tipping and processing sources, on-site paved roads, and the glass processing sources, are included. This more inclusive analysis allows the project to be designed holistically to minimize environmental impacts and give a more complete picture of all significant project related air impacts.

#### *6.1.9 Selection of Pollutants to Include in Analyses and Criteria*

Air pollutants included in this analysis are the five main criteria pollutants ($SO_2$, $NO_2$, $PM_{2.5}$, $PM_{10}$, and CO), and MassDEP air toxics (including lead). Odor impacts are also quantified. The selection of pollutants to include in the ambient air and odor impacts analysis is discussed in Section 4.0.

The NAAQS for the criteria pollutants are the health protective criteria for those pollutants. The MassDEP AALs and TELs, and RFCs, are the health protective criteria for air toxics. The AALs and TELs, and RFCs as appropriate, are listed with the air toxics analysis results in **Attachment D**. The odor criterion used for this analysis is 5 D/T, on a 5-minute average. The selected odor criterion is discussed further in Section 6.4 below.

## 6.2 Criteria Pollutants

Air quality impacts and results for criteria pollutants, as determined using air dispersion modeling, are presented in this section. Criteria pollutants evaluated are $NO_2$, $PM_{2.5}$, $PM_{10}$, CO, and $SO_2$. The selection of criteria pollutants for evaluation is discussed in the introductory portion of Section 4.0. The NAAQS are the standards used for evaluating criteria pollutant impacts, and these standards are discussed in Section 5.1.

Project mobile and stationary combustion sources and dust emitting sources generate criteria pollutants, and as such are included in the analysis. These sources are described in Section 3.0 and the derivation of emission rates from these sources are discussed in detail in Section 4.1 (stationary heating sources), Section 4.3 (cooling towers), Section 4.4 (MSW tipping and processing), 4.5 (glass processing), 4.6 (paved roads), and Section 4.7 (on- and off-site mobile sources).

### *6.2.1 Nitrogen Dioxide ($NO_2$)*

Oxides of nitrogen ($NO_x$) are emitted from combustion exhaust. For this facility, sources of $NO_x$ are the biosolids boiler and dryers, the glass processing building's space heaters, and mobile sources. USEPA has promulgated NAAQS to protect public health and property from impacts associated with $NO_x$ emissions.

#### *$NO_x$ to $NO_2$ Conversion*

Though the NAAQS are based on $NO_2$ concentrations, the majority of $NO_x$ emissions are in the form of nitric oxide (NO) rather than $NO_2$. Oxides of nitrogen undergo chemical conversion with atmospheric ozone to form $NO_2$. The AERMOD model incorporates a number of different routines to model this conversion:

- Full Conversion of $NO_x$ to $NO_2$
- The use of the Ambient Ratio Method (ARM2)
- The use of more sophisticated methods incorporating ambient ozone levels which factor into the chemical conversion process: the Ozone Limiting Method (OLM) and the Plume Volume Molar Ratio Method (PVMRM)

For this analysis, the OLM routine for $NO_x$ to $NO_2$ conversion was used with default ratios of 0.5 and 0.9 for minimum and maximum, respectively and concurrent (2013-2017) monitored ozone concentrations from hourly concentrations from the Fall River monitor were used. If data were unavailable from Fall River, data were substituted from the Fairhaven, Francis School in Providence or the Harrison Avenue in Boston ozone monitors. If data were unavailable from all four monitors, data was substituted from a previous hour from the Harrison Avenue monitor.

### *Results*

To attain the one-hour $NO_2$ standard, the three-year average of the 98th percentile of the maximum daily one-hour concentrations must not exceed 188 $\mu g/m^3$. This metric is represented in the modeling analysis as the maximum of the eighth-highest (H8H) 1-hour concentrations averaged over five years (as recommended by USEPA).[12] The Annual $NO_2$ NAAQS of 100 $\mu g/m^3$ is never to be exceeded and is confirmed by showing that the annual average for any individual year is below the 100 $\mu g/m^3$ value.

The air quality analysis shows a five-year average of the 1-hour H8H $NO_2$ impact of 177.0 $\mu g/m^3$, which includes background. This value is less than the applicable 1-hour $NO_2$ NAAQS of 188 $\mu g/m^3$.

A maximum predicted annual concentration of 46.6 $\mu g/m^3$, also which includes background. This value is far less than the applicable annual average $NO_2$ NAAQS of 100 $\mu g/m^3$.

Based on these results, it can be concluded that the project meets the applicable standards for $NO_2$.

### *6.2.2 Particulate Matter less than 2.5 µm in Diameter ($PM_{2.5}$)*

Particulate matter is emitted from both material handling as well as from combustion exhaust. For this facility, sources of $PM_{2.5}$ are the biosolids boiler and dryers, the glass processing building's space heaters, the MSW tipping and processing areas, the glass processing areas, paved roads, the cooling towers, and mobile sources. USEPA has also promulgated NAAQS to protect public health and property from impacts associated with $PM_{2.5}$ emissions.

### *Results*

To attain the 24-hour $PM_{2.5}$ standard, the three-year average of the 98th percentile of 24-hour concentrations must not exceed 35 $\mu g/m^3$. This metric is represented in the modeling analysis as the maximum of the eighth-highest (H8H) 24-hour concentrations averaged over five years (as recommended by USEPA).[13] For annual $PM_{2.5}$ averages, the three-year average of the highest annual observations must not exceed 12 $\mu g/m^3$. When modeling with

12 USEPA, 2010: Applicability of Appendix W Modeling Guidance for the 1-hour $NO_2$ National Ambient Air Quality Standard. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711. June 28, 2010.

13 USEPA, 2010: Modeling Procedures for Demonstrating Compliance with $PM_{2.5}$ NAAQS. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711. March 23, 2010.

National Weather Service meteorological data, rather than onsite measured data, USEPA recommends the maximum modeled value averaged over five years for determining compliance with this annual standard.

The air quality analysis shows a five-year average of the 24-hour H8H $PM_{2.5}$ impact of 7.43 $\mu g/m^3$. With the addition of the 17.5 $\mu g/m^3$ design value, a total $PM_{2.5}$ impact of 24.9 $\mu g/m^3$ is predicted, well below the NAAQS of 35 $\mu g/m^3$.

The five-year average of the annual concentrations shows a modeled impact of 2.82 $\mu g/m^3$ at the same location as above. Combined with a design value of 6.4 $\mu g/m^3$, a total annual $PM_{2.5}$ impact of 9.2 $\mu g/m^3$ is predicted, again well below the NAAQS of 12 $\mu g/m^3$.

Based on these results, it can be concluded that the project meets the applicable standards for $PM_{2.5}$.

### *6.2.3 Particulate Matter less than 10 $\mu m$ in Diameter ($PM_{10}$)*

Particulate matter is emitted from both material handling as well as from combustion exhaust. For this facility, sources of $PM_{10}$ are identical to the sources of $PM_{2.5}$. USEPA has also promulgated NAAQS to protect public health and property from impacts associated with $PM_{10}$ emissions.

#### *Results*

To attain the 24-hour $PM_{10}$ standard, the monitored concentrations must not exceed 150 $\mu g/m^3$ more than once per year on average over 3 years. This metric is represented in the modeling analysis as the maximum of the sixth-highest (H6H) 24-hour concentration over a modeled five year period.

The air quality analysis shows a H6H 24-hour $PM_{10}$ impact of 38.0 $\mu g/m^3$. With the addition of the 33.0 $\mu g/m^3$ design value, a total $PM_{10}$ impact of 71.0 $\mu g/m^3$ is predicted, well below the NAAQS of 150 $\mu g/m^3$.

Based on these results, it can be concluded that the project meets the applicable standard for $PM_{10}$.

### *6.2.4 Carbon Monoxide (CO)*

Carbon monoxide emissions (CO) are emitted from combustion exhaust. For this facility, sources of CO are the biosolids boiler and dryers, the glass processing building's space heaters, and mobile sources. Although carbon monoxide is quite harmful in higher concentrations in confined spaces, it is rare to see outdoor ambient concentrations near the NAAQS level.

### *Results*

To attain the 1-hour and 8-hour CO standards, the monitored concentrations must not be exceeded than once per year. This metric is represented in the modeling analysis as the maximum of the second-highest (H2H) 1-hour or 8-hour concentrations over a modeled five year period.

The air quality analysis shows a H2H 1-hour CO impact of 156.40 $\mu g/m^3$. With the addition of the 2005.5 $\mu g/m^3$ design value, a total 1-hour CO impact of 2161.9 $\mu g/m^3$ is predicted, well below the NAAQS of 40,000 $\mu g/m^3$.

For the 8-hour CO standard, a H2H impact of 96.6 $\mu g/m^3$. With the addition of the 1260.6 $\mu g/m^3$ design value, a total 8-hour CO impact of 1357.2 $\mu g/m^3$ is predicted, well below the NAAQS of 10,000 $\mu g/m^3$.

Based on these results, it can be concluded that the project meets the applicable standards for CO.

### *6.2.5 Sulfur Dioxide ($SO_2$)*

Sulfur dioxide is a product of combustion of fuels containing sulfur. Historically coal, diesel fuel, and heavy fuel oil has been the primary cause of $SO_2$ emissions but the trend towards low-sulfur fuels has significantly reduced $SO_2$ emissions in this region. Natural gas also contains trace amounts of sulfur, far less than the liquid petroleum fuels. For this project, all the stationary combustion sources are natural gas-fired. The mobile sources (loaders and onroad trucks) are required to use ultra-low sulfur diesel fuel to reduce $SO_2$ emissions.

### *Results*

To attain the one-hour $SO_2$ standard, the three-year average of the 99th percentile of the maximum daily one-hour concentrations must not exceed 195 $\mu g/m^3$. This metric is represented in the modeling analysis as the maximum of the fourth-highest (H4H) 1-hour concentrations averaged over five years (as recommended by USEPA). To attain the 3-hour $SO_2$ standard, the monitored concentrations must not be exceeded than once per year. This metric is represented in the modeling analysis as the maximum of the second-highest (H2H) 3-hour concentration over a modeled five year period.

The air quality analysis shows a five-year average of the 1-hour H4H $SO_2$ impact of 0.67 $\mu g/m^3$, which includes background. With the addition of the 24.5 $\mu g/m^3$ design value, a total 1-hour $SO_2$ impact of 25.2 $\mu g/m^3$ is predicted. This value is less than the applicable 1-hour $SO_2$ NAAQS of 195 $\mu g/m^3$.

The air quality analysis shows a H2H 3-hour $SO_2$ impact of 0.44 $\mu g/m^3$. With the addition of the 23.3 $\mu g/m^3$ design value, a total 3-hour $SO_2$ impact of 23.8 $\mu g/m^3$ is predicted, well below the NAAQS of 1300 $\mu g/m^3$.

Based on these results, it can be concluded that the project meets the applicable standards for $SO_2$.

### *6.2.6 Sensitive Locations (Receptors)*

For the four sensitive locations described in Section 6.1.6, all predicted criteria pollutant concentrations are well below applicable standards. The highest concentrations, as a percentage of NAAQS, are for 24-hour PM2.5. All modeled 24-hour PM2.5 concentrations at the sensitive receptors are well below 1 $\mu g/m^3$. With background of 17.5 $\mu g/m^3$ added, concentrations are approximately 50% of the 24-hour PM2.5 standard of 35 $\mu g/m^3$. Predicted concentrations for all other criteria pollutants at each of the four sensitive receptors are all below 45% of their applicable standards.

### *6.2.7 Additional Details*

As detailed above, all criteria pollutants which are emitted from the Project and which were evaluated comply with the NAAQS. Further information on the modeled concentrations of criteria pollutants relative to the NAAQS is presented in tabular format in **Attachment C**.

## 6.3 Air Toxics

Air quality impacts and results for air toxics, as determined using air dispersion modeling, are presented in this section. A large number of air toxics were evaluated. The selection of criteria pollutants for evaluation is discussed in the introductory portion of Section 4.0. The TELs, AALs, and RFCs are the standards used for evaluating air toxics impacts, and these standards are discussed in Section 5.14.

Project mobile and stationary combustion sources and biosolids process sources generate air toxics pollutants, and as such are included in the analysis. These sources are described in Section 3.0 and the derivation of emission rates from these sources are discussed in detail in Section 4.1 (stationary heating sources), Section 4.2 (biosolids process sources), and Section 4.7 (on- and off-site mobile sources).

The results of the air toxics analysis, using AERMOD air dispersion modeling and comparison of the maximum concentration impacts to the AALs and TELs (or RFCs, as appropriate), are included in tabular form in **Attachment D** to this report. No air toxic exceeds the AALs or TELs (or RFCs, as appropriate). Based on these results, it can be concluded that the project satisfies criteria for air toxics and, in addition, conforms to USEPA health protective criteria where Massachusetts guidelines are not published.

## 6.4 Odor

In Massachusetts, odor is regulated under 310 CMR 7.09 in that operations that emit odors shall not permit their emissions to "cause a condition of air pollution." A Draft Odor Policy for Composting Facilities was published by MassDEP in January 1996. This draft guidance document recommended a minimum design standard benchmark of 5 D/T, presumably on a 5-minute average basis. The odor impacts from this project are compared to this criterion.

D/T is a dimensionless ratio defined as the volume of dilution air divided by the volume of odorous air, or commonly described as the number of equivalent volumes of clean air which must be added to an odorous volume such that the odor is undetectable to the average person. Thus, a higher D/T value indicates that a sample must be diluted many times to become undetectable, indicating a stronger sample. Conversely, a weak sample would require only a few volumes to be introduced to make the odor sample undetectable.

An "odor unit per second" (OU/s) is equivalent to a mass emission rate for odor and is calculated by multiplying the odor source concentration (D/T, a dimensionless number) by the associated exhaust flow rate (cubic meters per second).

Odor is highly subjective and highly individualized. One person can find a smell tolerable or indifferent, while another finds the same smell highly offensive. Some individuals are capable of detecting odors that others cannot. Additionally, the criteria of what defines a "nuisance" are also subjective. Recurring impacts are likely far more offensive than rare or single occurrences. Therefore, the maximum predicted impact may not necessarily describe the total "nuisance" of the emitted odor.

Since dispersion modeling calculates hourly concentrations, the 1/5$^{th}$ (0.20 exponent) power law is typically used to convert from 1-hour to shorter minute averages.[14] The formula is often expressed as:

$$C_{new} = C_{old}\left(\frac{T_{old}}{T_{new}}\right)^{q}$$

Where "$C_{new}$" and "$C_{old}$" are the concentrations at two averaging times, "$T_{new}$" and "$T_{old}$" are the corresponding averaging times, and "q" is a value between 0.17 and 0.20.

Since the air dispersion modeling results are stated on a 1-hour average basis (60-minute average), a scaling factor is required to assess the resulting concentrations on a 5-minute average basis. The following power law and resulting scaling factor of 1.64 were used in this analysis.

14 Wark, K. and C. Warner, 1981. Air Pollution: Its Origin and Control, 2nd Edition, Harper Collins Publishers.

$$\left(\frac{60\ minutes}{5\ minute}\right)^{0.2} = 1.64$$

As an example, a D/T of 3.04 on a 1-hour average would be equivalent to a D/T of 5 on a 5-minute average (3.04 x 1.64 = 5).

For the stack and odor control design criteria, the following power law and resulting scaling factor of 2.27 were used in this analysis.

$$\left(\frac{60\ minutes}{1\ minute}\right)^{0.2} = 2.27$$

As an example, a D/T of 0.441 on a 1-hour average would be equivalent to a D/T of 1 on a 1-minute average (0.441 x 2.27 = 1).

The above two examples illustrate, on an hourly basis, a 1 D/T, 1-minute average criterion is almost an order of magnitude more stringent than a 5 D/T, 5-minute average criterion.

### *6.4.1 Methodology*

The criterion used in this analysis to determine that the project is not a nuisance source of odors, is for maximum 5-minute odor concentrations to be at or below 5 D/T. Odor concentrations predicted to exceed this threshold do not necessarily constitute an unfavorable odor impact. Nor do concentrations below this threshold imply that one will never sense the nuisance odor. Atmospheric dispersion is far more complicated than the models can mathematically simulate. Predicted results near the threshold indicate a reasonable effort to control odor migration offsite.

An odor concentration threshold of 1 D/T, on a 1-minute average basis, is the criterion used in this analysis for *design* of stacks and odor controls to avoid nuisance odor impacts in the nearby residential neighborhoods. This stringent criterion has been used as a design benchmark and is more conservative than the MassDEP Draft Policy.

Modeling analyzed odor emission rates (OU/s) from the two distinct odor-producing processes onsite: MSW tipping and processing, and biosolids processing. Since these two types of sources each produce separately distinguishable odors, they were analyzed individually. That is, odors associated with MSW tipping and processing have different recognizable properties compared to those associated with biosolids processing.

### *6.4.2 Results*

The results of the predicted odor impacts are tabulated below in Table 6-3.

**Table 6-3 Summary of Predicted Odor Impacts**

| Source | Criterion (Note 1) | Receptor | Number of Predicted Events over 5 years of modeled weather data (Note 2) |
|---|---|---|---|
| Biosolids process | Concentration over 5 D/T, 5-minute average | Anywhere offsite | 0 |
| Biosolids process | Concentration over 1 D/T, 1-minute average | Any residential neighborhood | 0 |
| MSW process | Concentration over 5 D/T, 5-minute average | Anywhere offsite | 0 |
| MSW process | Concentration over 1 D/T, 1-minute average | Any residential neighborhood | 0 |

Notes:

(1) D/T is a dimensionless ratio defined as the volume of dilution air divided by the volume of odorous air, or commonly described as the number of equivalent volumes of clean air which must be added to an odorous volume such that the odor is undetectable to the average person. The 5 D/T criterion is from a draft MassDEP policy for composting, and the 1 D/T criterion is a design benchmark that is more conservative than the draft MassDEP policy.

(2) Modeled concentration is the highest predicted concentration in ambient air at any of 6500 receptors, over 5 years of weather conditions.

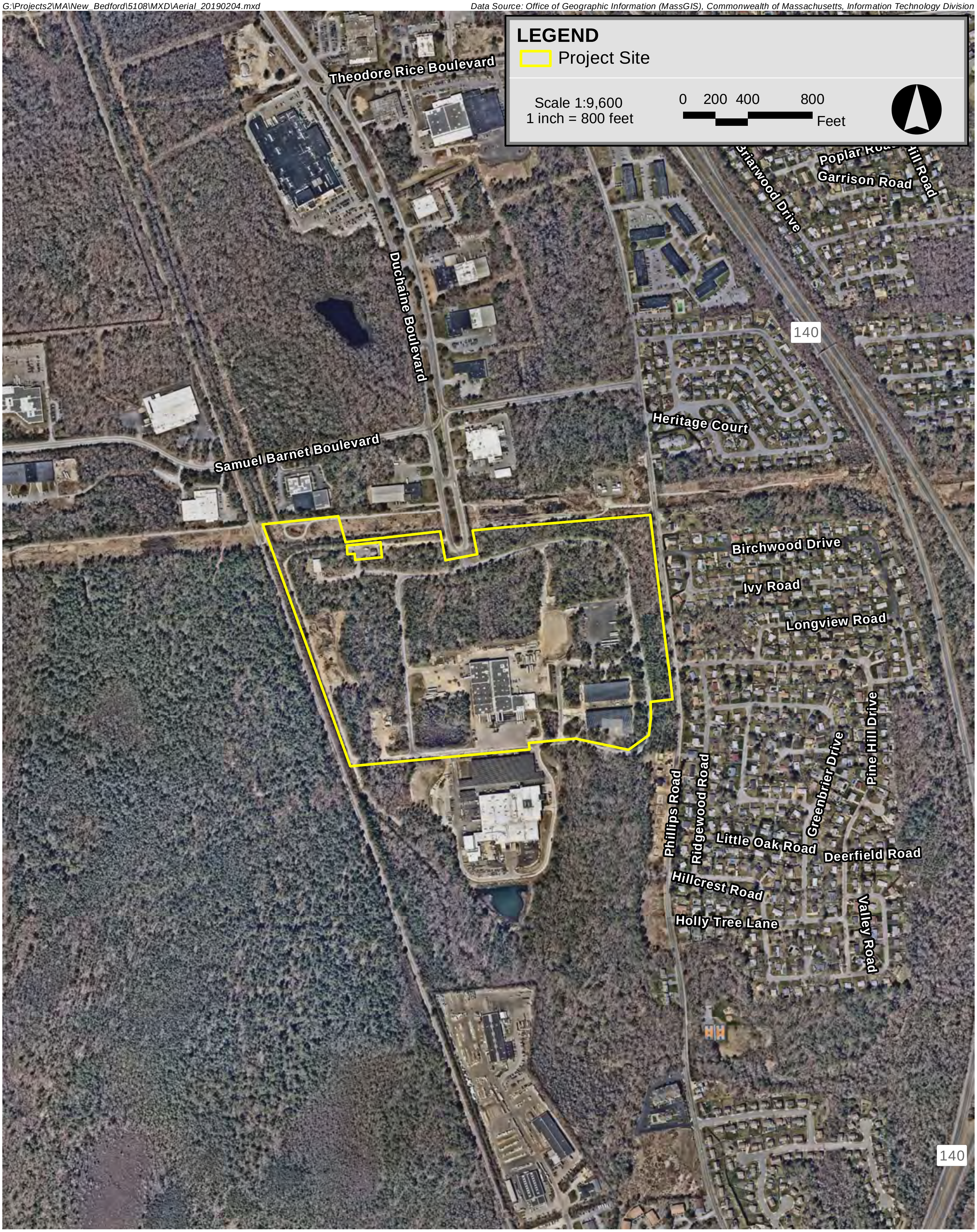
#### *6.4.3 Odor Conclusions*

The proposed project has been specifically designed to avoid causation of odor "nuisance" conditions in the residential neighborhoods. The biosolids odor will be managed by use of odor control technologies (ionization and a biofilter with carbon/zeolite polishing, or equal) and by stacks designed with good dispersion characteristics (stack heights 10-feet above the biosolids building with relatively high exit velocities). The MSW odor will be managed by use of high dilution air flows and by stack designs and locations that enhance odor dispersion (clustered, tall stacks 30-feet above the MSW buildings).

## 6.5 General Conclusions

The predicted air pollutant and odor concentrations are shown to be below the applicable NAAQS, MassDEP AALs and TELs (and RFCs, as applicable), and protective odor concentration criterion, using the USEPA AERMOD model. Therefore, it can be concluded that the proposed project as designed does not cause or contribute to a condition of air pollution in the area.

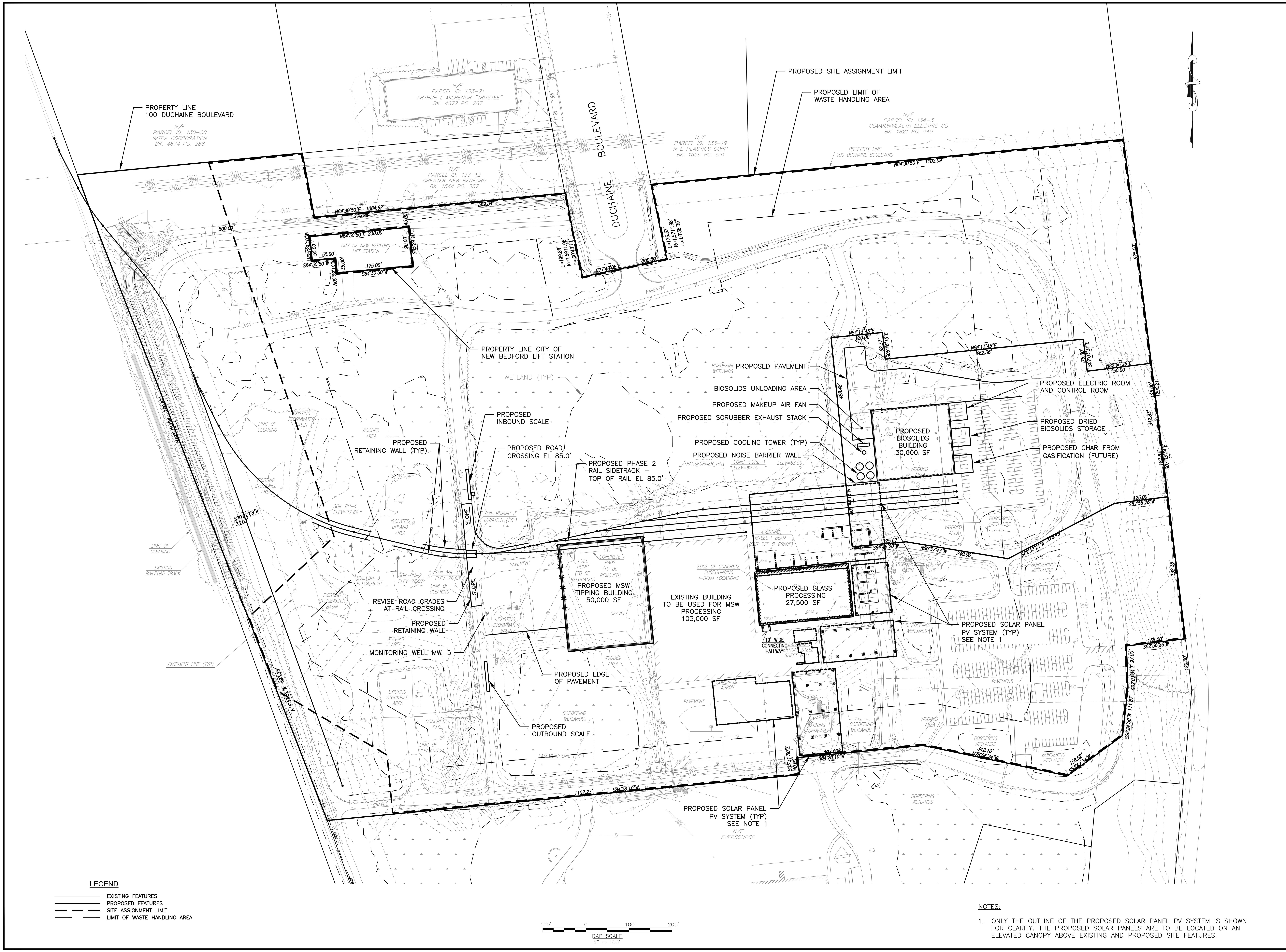
# Figures

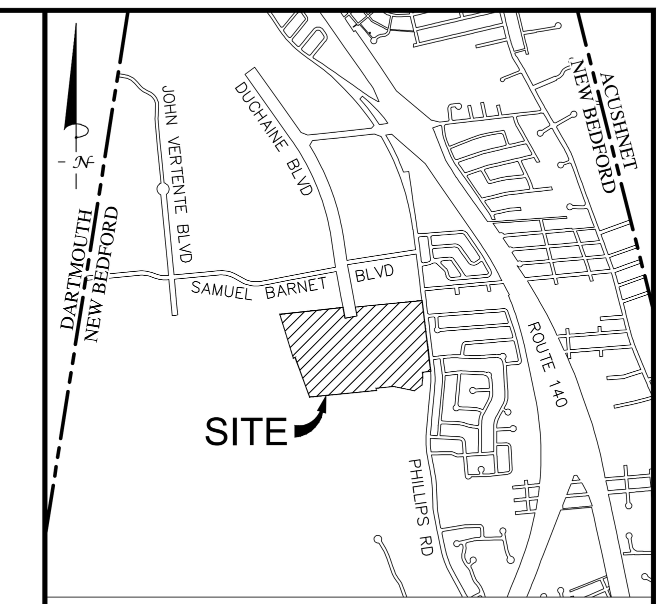



**Parallel Products** **New Bedford, Massachusetts**

Epsilon ASSOCIATES INC.

**Figure 1**
*Aerial Locus Map*

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REVISIONS

| NO. | DATE | COMMENT |
|---|---|---|
| A | 2/4/2019 | ISSUED FOR PERMITTING |

PURPOSE:
PERMITTING

LOCUS:
100 DUCHAINE BOULEVARD
NEW BEDFORD,
MASSACHUSETTS

PREPARED FOR:
PARALLEL PRODUCTS, LLC

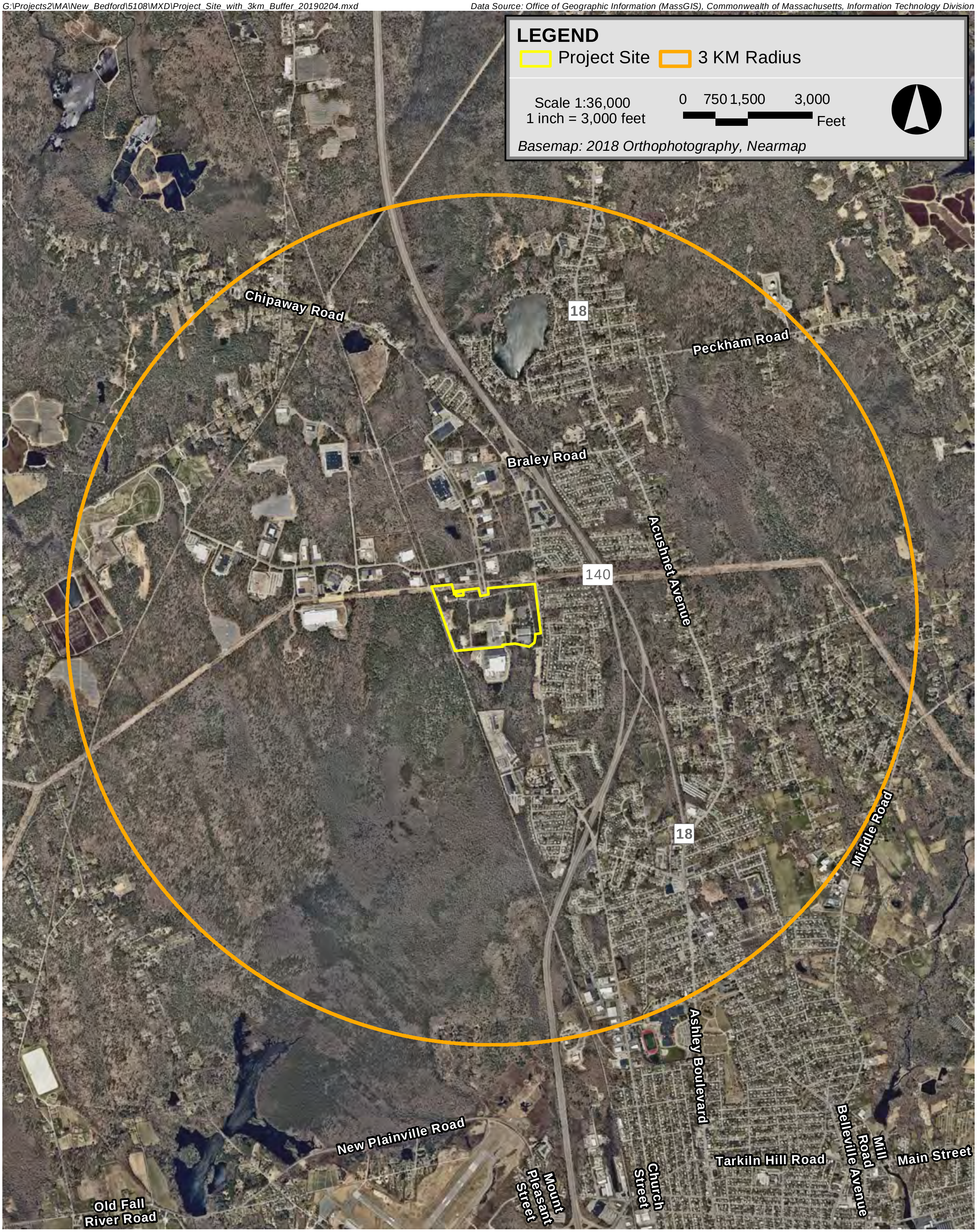
DRAWING TITLE:
PHASE 2 SITE PLAN

| CAD TECH: | CHECKED BY: |
|---|---|
| T. JANICKI | |
| ENGINEER: | DATE: |
| W. HALL | 2/1/2019 |

SCALE: 1"=100'

SHEET: C2A

**Figure 2**
**Conceptual Layout / Phase 2 Site Plan**
**(Green Seal Environmental, Inc.)**




**Parallel Products** **New Bedford, Massachusetts**

Epsilon ASSOCIATES INC.

**Figure 3**

*Proposed Project Site and 3 Kilometer Radius*

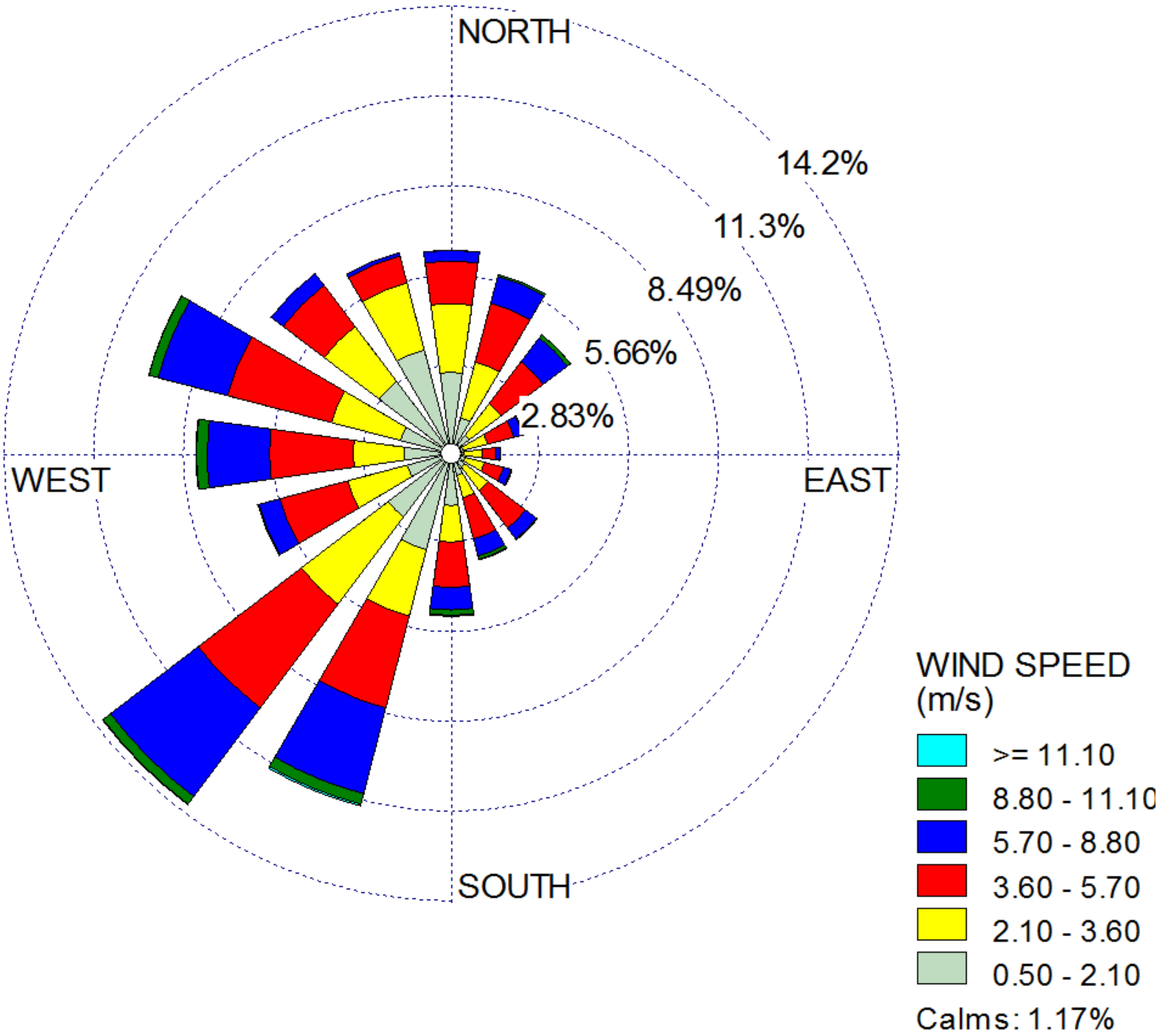





**Figure 4**

*2013-2017 New Bedford Regional Airport Wind Rose*

G:\Projects2\MA\New_Bedford\5108\MXD\Receptor_Locations_20190128.mxd

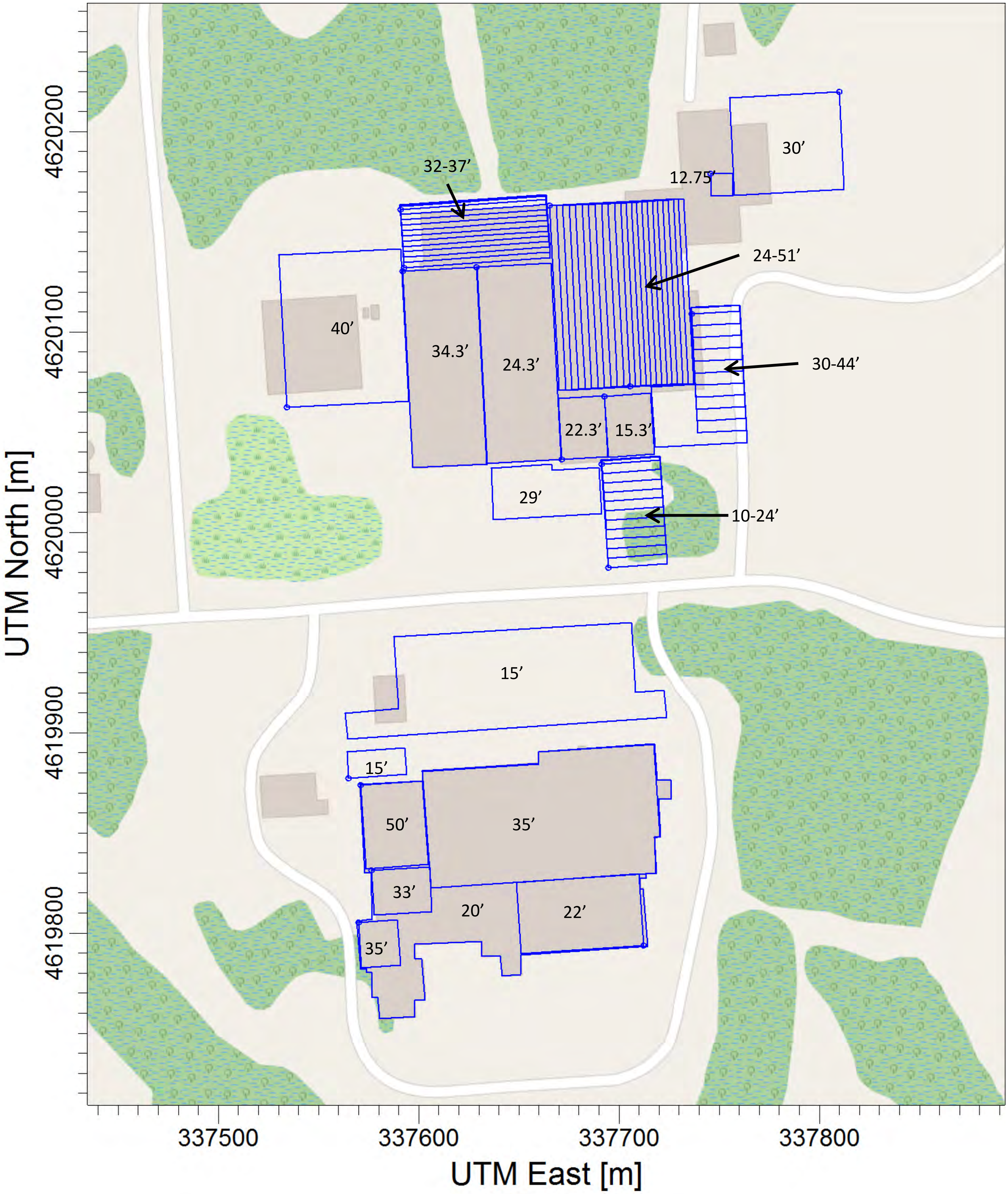
Data Source: Office of Geographic Information (MassGIS), Commonwealth of Massachusetts, Information Technology Division


**Parallel Products New Bedford, Massachusetts**

Epsilon ASSOCIATES INC.

**Figure 5**

*Receptor Locations*




**Parallel Products of New England New Bedford, Massachusetts**

# Attachment A

Stack Parameters

| Process | Source | ID | Model ID | Merged Plume from Multiple Stacks? | X Coord (ft) | Y Coord (ft) | Base Elevation (ft) | Stack Height AGL (ft) | Roof Height AGL (ft) | Stack Height Above Roof (ft) | Gas Exit Tempera-ture (oF) | Temp Relative to | Exhaust Flow Rate (cfm) | Stack Inside Diameter (inches) | Stack Inside Diameter (feet) | Stack Cross-Sectional Area (ft2) | Stack Exit Velocity (fps) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Biosolids | Ionization | 1 | BIOION1 | No | 1108155 | 15157934 | 79.56 | 40 | 30 | 10 | 10 | above ambient | 24,250 | 32 | 2.67 | 5.585 | 72.4 | |
| Biosolids | Ionization | 2 | BIOION2 | No | 1108246 | 15157938 | 79.56 | 40 | 30 | 10 | 10 | above ambient | 24,250 | 32 | 2.67 | 5.585 | 72.4 | |
| Biosolids | Scrubber | | BIOCS | No | 1108084 | 15157921 | 79.56 | 40 | 30 | 10 | 10 | above ambient | 19,500 | 28 | 2.33 | 4.276 | 76.0 | |
| Biosolids | Ionization Winter Ops | 1 | BIOION1W | No | 1108155 | 15157934 | 79.56 | 40 | 30 | 10 | 50 | absolute | 24,250 | 32 | 2.67 | 5.585 | 72.4 | |
| Biosolids | Ionization Winter Ops | 2 | BIOION2W | No | 1108246 | 15157938 | 79.56 | 40 | 30 | 10 | 50 | absolute | 24,250 | 32 | 2.67 | 5.585 | 72.4 | |
| Biosolids | Scrubber Winter Ops | | BIOCSW | No | 1108084 | 15157921 | 79.56 | 40 | 30 | 10 | 50 | absolute | 19,500 | 28 | 2.33 | 4.276 | 76.0 | |
| Biosolids | Boiler | | BIOBOIL | No | 1108267 | 15157877 | 79.56 | 40 | 30 | 10 | 140 | absolute | 712 | 6 | 0.50 | 0.196 | 60.4 | |
| Biosolids | Dryers (4) | | BIODRYM | **Yes** | 1108200 | 15157863 | 79.56 | 40 | 30 | 10 | 140 | absolute | 4,744 | 16.02 | 1.34 | 1.400 | 56.5 | Each individual stack diameter 8" |
| Biosolids | Cooling Tower | 1 | BIOCT1 | No | 1108085 | 15157875 | 79.33 | 12.76 | NA | NA | 16 | above ambient | 91,030 | 117 | 9.75 | 74.662 | 20.3 | |
| Biosolids | Cooling Tower | 2 | BIOCT2 | No | 1108103 | 15157875 | 79.33 | 12.76 | NA | NA | 16 | above ambient | 91,030 | 117 | 9.75 | 74.662 | 20.3 | |
| Biosolids | Cooling Tower | 3 | BIOCT3 | No | 1108087 | 15157854 | 79.33 | 12.76 | NA | NA | 16 | above ambient | 91,030 | 117 | 9.75 | 74.662 | 20.3 | |
| Biosolids | Cooling Tower | 4 | BIOCT4 | No | 1108103 | 15157855 | 79.33 | 12.76 | NA | NA | 16 | above ambient | 91,030 | 117 | 9.75 | 74.662 | 20.3 | |
| Glass | Building Stack | | GLASSVNT | No | 1107950 | 15157588 | 81.56 | 32 | 22 | 10 | 10 | above ambient | 24,000 | 52 | 4.33 | 14.748 | 27.1 | |
| MSW | Transfer Stacks (4) | | TVENTM | **Yes** | 1107465 | 15157635 | 80.15 | 70 | 40 | 30 | 10 | above ambient | 96,000 | 104.2 | 8.68 | 59.219 | 27.0 | Each individual stack diameter 52" |
| MSW | Processing Stacks (3) | | PVENTM | **Yes** | 1107641 | 15157564 | 81.40 | 70 | 40 | 30 | 10 | above ambient | 72,000 | 90.3 | 7.53 | 44.474 | 27.0 | Each individual stack diameter 52" |

| Process | Source | ID | Model ID | Merged Plume from Multiple Stacks? | X Coord (m) | Y Coord (m) | Base Elevation (m) | Stack Height AGL (m) | Roof Height AGL (m) | Stack Height Above Roof (m) | Gas Exit Tempera-ture (K) | Temp Relative to | Exhaust Flow Rate (m3/hr) | Stack Inside Diameter (m) | Stack Cross-Sectional Area (m2) | Stack Exit Velocity (m/s) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Biosolids | Ionization | 1 | BIOION1 | No | 337769.67 | 4620194.6 | 24.25 | 12.19 | 9.14 | 3.05 | 5.56 | above ambient | 41,203 | 0.813 | 0.519 | 22.1 | |
| Biosolids | Ionization | 2 | BIOION2 | No | 337797.58 | 4620195.71 | 24.25 | 12.19 | 9.14 | 3.05 | 5.56 | above ambient | 41,203 | 0.813 | 0.519 | 22.1 | |
| Biosolids | Scrubber | | BIOCS | No | 337748.03 | 4620190.49 | 24.25 | 12.19 | 9.14 | 3.05 | 5.56 | above ambient | 33,132 | 0.711 | 0.397 | 23.2 | |
| Biosolids | Ionization Winter Ops | 1 | BIOION1W | No | 337769.67 | 4620194.60 | 24.25 | 12.19 | 9.14 | 3.05 | 283.15 | absolute | 41,203 | 0.813 | 0.519 | 22.1 | |
| Biosolids | Ionization Winter Ops | 2 | BIOION2W | No | 337797.58 | 4620195.71 | 24.25 | 12.19 | 9.14 | 3.05 | 283.15 | absolute | 41,203 | 0.813 | 0.519 | 22.1 | |
| Biosolids | Scrubber Winter Ops | | BIOCSW | No | 337748.03 | 4620190.49 | 24.25 | 12.19 | 9.14 | 3.05 | 283.15 | absolute | 33,132 | 0.711 | 0.397 | 23.2 | |
| Biosolids | Boiler | | BIOBOIL | No | 337804.03 | 4620177.19 | 24.25 | 12.19 | 9.14 | 3.05 | 333.15 | absolute | 1,209 | 0.152 | 0.018 | 18.4 | |
| Biosolids | Dryers (4) | | BIODRYM | **Yes** | 337783.51 | 4620172.70 | 24.25 | 12.19 | 9.14 | 3.05 | 333.15 | absolute | 8,060 | 0.407 | 0.130 | 17.2 | Each individual stack diameter 0.203 m |
| Biosolids | Cooling Tower | 1 | BIOCT1 | No | 337748.33 | 4620176.33 | 24.18 | 3.89 | NA | NA | 9 | above ambient | 154,667 | 2.972 | 6.936 | 6.19 | |
| Biosolids | Cooling Tower | 2 | BIOCT2 | No | 337753.83 | 4620176.33 | 24.18 | 3.89 | NA | NA | 9 | above ambient | 154,667 | 2.972 | 6.936 | 6.19 | |
| Biosolids | Cooling Tower | 3 | BIOCT3 | No | 337748.90 | 4620170.13 | 24.18 | 3.89 | NA | NA | 9 | above ambient | 154,667 | 2.972 | 6.936 | 6.19 | |
| Biosolids | Cooling Tower | 4 | BIOCT4 | No | 337753.97 | 4620170.41 | 24.18 | 3.89 | NA | NA | 9 | above ambient | 154,667 | 2.972 | 6.936 | 6.19 | |
| Glass | Building Stack | | GLASSVNT | No | 337707.29 | 4620089.09 | 24.86 | 9.75 | 6.71 | 3.05 | 5.56 | above ambient | 40,778 | 1.321 | 1.370 | 8.27 | |
| MSW | Transfer Stacks (4) | | TVENTM | **Yes** | 337559.45 | 4620103.24 | 24.43 | 21.34 | 12.19 | 9.14 | 5.56 | above ambient | 163,111 | 2.647 | 5.502 | 8.24 | Each individual stack diameter 1.32 m |
| MSW | Processing Stacks (3) | | PVENTM | **Yes** | 337613.01 | 4620081.63 | 24.81 | 21.34 | 12.19 | 9.14 | 5.56 | above ambient | 122,333 | 2.294 | 4.132 | 8.22 | Each individual stack diameter 1.32 m |

Attachment A Note

Note the stack parameters, designs, and locations presented in this attachment are conceptual and subject to refinement during detailed design review. Future changes will include equivalent process, stack, or control designs or other mitigation measures to meet the criteria for $NO_2$, $PM_{2.5}$, odor, and air toxics which are presented in this report.

**Merged Stack Diameter Calculations**

| Stack | Number of Stacks | Individual Stack Diameter | Individual Stack Diameter | Individual Stack Area | Total Stack Area | Equivalent Diameter | Equivalent Diameter | Total Volume Flow | Stack Velocity |
|---|---|---|---|---|---|---|---|---|---|
| | | in | ft | $ft^2$ | $ft^2$ | ft | in | cfm | fps |
| Dryers | 4 | 8 | 0.67 | 0.35 | 1.396 | 1.33 | 16.0 | 4,744 | 56.6 |
| MSW Transfer Stacks | 4 | 52 | 4.33 | 14.75 | 58.99 | 8.67 | 104 | 96,000 | 27.1 |
| MSW Processing Stacks | 3 | 52 | 4.33 | 14.75 | 44.24 | 7.51 | 90.1 | 72,000 | 27.1 |

**Example Calculations:**

(8 in diameter) x (1 ft/12 in) = 0.67 ft individual stack diameter

(0.67 ft diameter)$^2$ x (π) x (1/4) = 0.35 ft$^2$ individual stack area

(0.35 ft2 individual stack area) x (4 stacks) = 1.396 ft2 total stack area

((1.396 ft2 total stack area) x (1/π) x (4))^(1/2) = 1.33 ft equivalent diameter

(1.33 ft equivalent diameter) x (12 in/ 1 ft) = 16.0 in equivalent diameter

(4,744 cfm exhaust flow) x (1 min / 60 sec) x (1/1.396 ft2 total stack area) = 56.6 fps velocity

# Attachment B

## Air and Odor Emission Calculations

| Boiler Assumed MMBTU/hr | 3 |
|---|---|

| Compound | Natural Gas Emissioni Factor (lb/MMscf) | Natural Gas Emission Factor (lb/MMBtu) | Mass Emissions (lb/hr) | Mass Emissions (g/s) |
|---|---|---|---|---|
| Nitrogen oxides (NOx) | 100.00 | 0.0980 | 0.294 | 0.0371 |
| Carbon monoxide (CO) | 84.00 | 0.0824 | 0.247 | 0.0311 |
| Particulate Matter (PM10, PM2.5) | 7.60 | 0.00745 | 0.0224 | 0.00282 |
| Sulfur Dioxide (SO2) | 0.60 | 0.000588 | 0.00176 | 0.000222 |
| Volatile Organic Compounds (VOC) | 5.50 | 0.00539 | 0.0162 | 0.00204 |
| Carbon dioxide (CO2) | 120,000 | 118 | 353 | 44 |
| Lead | 0.0005 | 4.90E-07 | 1.47E-06 | 1.85E-07 |

| | | |
|---|---|---|
| Hazen & Sawyer Building Heat Gas Use per Year | 2.7 | MMscf/yr |
| | 2,754 | MMBtu/yr |

| Indvidual Dryer MMBTU/hr | 5 | each (there are 4 totalling 20 MMBtu/hr) |
|---|---|---|

| Compound | Natural Gas Emissioni Factor (lb/MMscf) | Natural Gas Emission Factor (lb/MMBtu) | Mass Emissions (lb/hr) | Mass Emissions (g/s) |
|---|---|---|---|---|
| Nitrogen oxides (NOx) | 159.00 | 0.1559 | 0.779 | 0.0982 |
| Carbon monoxide (CO) | 84.00 | 0.0824 | 0.412 | 0.0519 |
| Particulate Matter (PM10, PM2.5) | 7.60 | 0.00745 | 0.0373 | 0.00469 |
| Sulfur Dioxide (SO2) | 0.60 | 0.000588 | 0.00294 | 0.000371 |
| Volatile Organic Compounds (VOC) | 5.50 | 0.00539 | 0.0270 | 0.00340 |
| Carbon dioxide (CO2) | 120,000 | 118 | 588 | 74.1 |
| Lead | 0.0005 | 4.90E-07 | 2.45E-06 | 3.09E-07 |

| SOURCES | Restriction | Number | Type | NOX (g/s) | CO (g/s) | PM10 (g/s) | PM2.5 (g/s) | SO2 (g/s) |
|---|---|---|---|---|---|---|---|---|
| Biosolids Boiler Hourly | Winter | 1 | Point | 0.0371 | 0.0311 | 0.00282 | 0.00282 | 0.000222 |
| Glass Building Heating Hourly | Winter | 1 | Point | 0.0371 | 0.0311 | 0.00282 | 0.00282 | 0.000222 |
| Dryer Hourly | | 4 | Point | 0.0982 | 0.0519 | 0.00469 | 0.00469 | 0.000371 |

[1] Hourly emissions are max lb/hr converted to g/s

| Dryer Burner Assumed MMBTU/hr | 5 | (there are 4 of these for a total of 20 MMBtu/hr) |
|---|---|---|

| Compound | Natural Gas Emission Factor (lb/MMscf) | Natural Gas Emission Factor (lb/MMBtu) | Mass Emissions (lb/hr) | Mass Emissions (g/s) | Mass Emissions (TPY) | MassDEP Air Toxic? |
|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | 2.40E-05 | 2.35E-08 | 1.18E-07 | 1.48E-08 | 5.15E-07 | * |
| Benzene | 2.10E-03 | 2.06E-06 | 1.03E-05 | 1.30E-06 | 4.51E-05 | Yes |
| Dichlorobenzene | 1.20E-03 | 1.18E-06 | 5.88E-06 | 7.41E-07 | 2.58E-05 | ** |
| Formaldehyde | 7.50E-02 | 7.35E-05 | 3.68E-04 | 4.63E-05 | 1.61E-03 | Yes |
| Hexane | 1.80E+00 | 1.76E-03 | 8.82E-03 | 1.11E-03 | 3.86E-02 | Yes*** |
| Naphthalene | 6.10E-04 | 5.98E-07 | 2.99E-06 | 3.77E-07 | 1.31E-05 | * |
| Toluene | 3.40E-03 | 3.33E-06 | 1.67E-05 | 2.10E-06 | 7.30E-05 | Yes |
| Arsenic | 2.00E-04 | 1.96E-07 | 9.80E-07 | 1.24E-07 | 4.29E-06 | Yes |
| Beryllium | 1.20E-05 | 1.18E-08 | 5.88E-08 | 7.41E-09 | 2.58E-07 | Yes |
| Cadmium | 1.10E-03 | 1.08E-06 | 5.39E-06 | 6.79E-07 | 2.36E-05 | Yes |
| Chromium | 1.40E-03 | 1.37E-06 | 6.86E-06 | 8.65E-07 | 3.01E-05 | Yes |
| Copper | 8.50E-04 | 8.33E-07 | 4.17E-06 | 5.25E-07 | 1.83E-05 | Yes |
| Lead | 0.0005 | 4.90E-07 | 2.45E-06 | 3.09E-07 | 1.07E-05 | Yes |
| Mercury | 2.60E-04 | 2.55E-07 | 1.27E-06 | 1.61E-07 | 5.58E-06 | Yes |
| Nickel | 2.10E-03 | 2.06E-06 | 1.03E-05 | 1.30E-06 | 4.51E-05 | Yes |
| Selenium | 2.40E-05 | 2.35E-08 | 1.18E-07 | 1.48E-08 | 5.15E-07 | Yes |
| Vanadium | 2.30E-03 | 2.25E-06 | 1.13E-05 | 1.42E-06 | 4.94E-05 | Yes |

| MassDEP Air Toxics Special Notes: | lb/hr | g/s |
|---|---|---|
| * Compare sum of naphtalene and 1-methylnaphthalene for AAL and TEL | **3.11E-06** | **3.92E-07** |
| ** Assume worst case ortho isomer for AAL and TEL comparison | | |
| *** Alkanes and alkenes classification includes and mentions hexane | | |

USEPA AP-42 uses 1,020 Btu/scf as the HHV of natural gass

| Boiler Assumed MMBTU/hr | 3 |
|---|---|

Hazen & Sawyer Building Heat Gas Us(  2.7  MMscf/yr

2,754  MMBtu/yr

| Compound | Natural Gas Emission Factor (lb/MMscf) | Natural Gas Emission Factor (lb/MMBtu) | Mass Emissions (lb/hr) | Mass Emissions (g/s) | Mass Emissions (TPY) | MassDEP Air Toxic? |
|---|---|---|---|---|---|---|
| **2-Methylnaphthalene** | **2.40E-05** | **2.35E-08** | **7.06E-08** | **8.89E-09** | **3.24E-08** | ***** |
| **Benzene** | **2.10E-03** | **2.06E-06** | **6.18E-06** | **7.78E-07** | **2.84E-06** | **Yes** |
| **Dichlorobenzene** | **1.20E-03** | **1.18E-06** | **3.53E-06** | **4.45E-07** | **1.62E-06** | ****** |
| **Formaldehyde** | **7.50E-02** | **7.35E-05** | **2.21E-04** | **2.78E-05** | **1.01E-04** | **Yes** |
| **Hexane** | **1.80E+00** | **1.76E-03** | **5.29E-03** | **6.67E-04** | **2.43E-03** | **Yes***** |
| **Naphthalene** | **6.10E-04** | **5.98E-07** | **1.79E-06** | **2.26E-07** | **8.24E-07** | ***** |
| **Toluene** | **3.40E-03** | **3.33E-06** | **1.00E-05** | **1.26E-06** | **4.59E-06** | **Yes** |
| **Arsenic** | **2.00E-04** | **1.96E-07** | **5.88E-07** | **7.41E-08** | **2.70E-07** | **Yes** |
| **Beryllium** | **1.20E-05** | **1.18E-08** | **3.53E-08** | **4.45E-09** | **1.62E-08** | **Yes** |
| **Cadmium** | **1.10E-03** | **1.08E-06** | **3.24E-06** | **4.08E-07** | **1.49E-06** | **Yes** |
| **Chromium** | **1.40E-03** | **1.37E-06** | **4.12E-06** | **5.19E-07** | **1.89E-06** | **Yes** |
| **Copper** | **8.50E-04** | **8.33E-07** | **2.50E-06** | **3.15E-07** | **1.15E-06** | **Yes** |
| **Lead** | **0.0005** | **4.90E-07** | **1.47E-06** | **1.85E-07** | **6.75E-07** | **Yes** |
| **Mercury** | **2.60E-04** | **2.55E-07** | **7.65E-07** | **9.64E-08** | **3.51E-07** | **Yes** |
| **Nickel** | **2.10E-03** | **2.06E-06** | **6.18E-06** | **7.78E-07** | **2.84E-06** | **Yes** |
| **Selenium** | **2.40E-05** | **2.35E-08** | **7.06E-08** | **8.89E-09** | **3.24E-08** | **Yes** |
| **Vanadium** | **2.30E-03** | **2.25E-06** | **6.76E-06** | **8.52E-07** | **3.11E-06** | **Yes** |

MassDEP Air Toxics Special Notes:

* Compare sum of naphtalene and 1-methylnaphthalene for AAL and TEL

| lb/hr | g/s |
|---|---|
| **1.86E-06** | **2.35E-07** |

** Assume worst case ortho isomer for AAL and TEL comparison

*** Alkanes and alkenes classification includes and mentions hexane

USEPA AP-42 uses 1,020 Btu/scf as the HHV of natural gas

| Compound | Biosolids Boiler | | Glass Building Heating | | Dryer Burner | | Notes |
|---|---|---|---|---|---|---|---|
| | Hourly | Annual[4] | Hourly | Annual[4] | Hourly | Annual | |
| | g/s | g/s | g/s | g/s | g/s | g/s | |
| 2-Methylnaphthalene | 8.89E-09 | 2.81E-09 | 8.89E-09 | 2.81E-09 | 1.48E-08 | 1.48E-08 | 1 |
| Benzene | 7.78E-07 | 2.46E-07 | 7.78E-07 | 2.46E-07 | 1.30E-06 | 1.30E-06 | |
| Dichlorobenzene | 4.45E-07 | 1.41E-07 | 4.45E-07 | 1.41E-07 | 7.41E-07 | 7.41E-07 | 2 |
| Formaldehyde | 2.78E-05 | 8.79E-06 | 2.78E-05 | 8.79E-06 | 4.63E-05 | 4.63E-05 | |
| Hexane | 6.67E-04 | 2.11E-04 | 6.67E-04 | 2.11E-04 | 1.11E-03 | 1.11E-03 | 3 |
| Naphthalene | 2.26E-07 | 7.15E-08 | 2.26E-07 | 7.15E-08 | 3.77E-07 | 3.77E-07 | 1 |
| Toluene | 1.26E-06 | 3.98E-07 | 1.26E-06 | 3.98E-07 | 2.10E-06 | 2.10E-06 | |
| Arsenic | 7.41E-08 | 2.34E-08 | 7.41E-08 | 2.34E-08 | 1.24E-07 | 1.24E-07 | |
| Beryllium | 4.45E-09 | 1.41E-09 | 4.45E-09 | 1.41E-09 | 7.41E-09 | 7.41E-09 | |
| Cadmium | 4.08E-07 | 1.29E-07 | 4.08E-07 | 1.29E-07 | 6.79E-07 | 6.79E-07 | |
| Chromium | 5.19E-07 | 1.64E-07 | 5.19E-07 | 1.64E-07 | 8.65E-07 | 8.65E-07 | |
| Copper | 3.15E-07 | 9.96E-08 | 3.15E-07 | 9.96E-08 | 5.25E-07 | 5.25E-07 | |
| Lead | 1.85E-07 | 5.86E-08 | 1.85E-07 | 5.86E-08 | 3.09E-07 | 3.09E-07 | |
| Mercury | 9.64E-08 | 3.05E-08 | 9.64E-08 | 3.05E-08 | 1.61E-07 | 1.61E-07 | |
| Nickel | 7.78E-07 | 2.46E-07 | 7.78E-07 | 2.46E-07 | 1.30E-06 | 1.30E-06 | |
| Selenium | 8.89E-09 | 2.81E-09 | 8.89E-09 | 2.81E-09 | 1.48E-08 | 1.48E-08 | |
| Vanadium | 8.52E-07 | 2.69E-07 | 8.52E-07 | 2.69E-07 | 1.42E-06 | 1.42E-06 | |

<u>MassDEP Air Toxics Special Notes:</u>

1 Compare sum of naphtalene and 2-methylnaphthalene for AAL and TEL

2 Assume worst case ortho isomer for AAL and TEL comparison

3 Alkanes and alkenes classification includes and mentions hexane

4 Annual Boiler Emissions are winter season only and are thus the total tpy divided by 2904 hours in Winter

**Biofilter Air Toxics Mass Rates - Conservatively Assume Wet Scrubber Emission Rates = Biofilter Emission Rates**
(A wet scrubber has greater removal efficiency capability than a biofilter for odor and air toxics)

Exhaust Flow Rate (V) 19,500 cfm

| Exhaust Concentrations | | | | Fractional | Formula | MW |
|---|---|---|---|---|---|---|
| $H_2S$ | 0.09 | ppm | 1,000,000 | 9.000E-08 | 2H + S | 34 |
| Carbonyl Sulfide | 18.5 | ppb | 1,000,000,000 | 1.850E-08 | C + O + S | 60 |
| Ammonia | 4.5 | ppm | 1,000,000 | 4.500E-06 | 3H + N | 17 |

Ideal Gas Law PV = m/MW R T (m = P V MW / R / T)

0.7302 ft3-atm/deg.R-lbmol Ideal Gas Law Constant

68 deg.F Temperature
528 deg.R = (deg.F) + 460

1 atm Pressure

| Exhaust Mass Rates | lb/min | lb/hr | grams/sec |
|---|---|---|---|
| $H_2S$ | 1.548E-04 | 9.286E-03 | 1.170E-03 |
| Carbonyl Sulfide | 5.614E-05 | 3.368E-03 | 4.244E-04 |
| Ammonia | 3.869E-03 | 2.322E-01 | 2.925E-02 |

**Ionization Air Toxics Mass Rates**

Exhaust Flow Rate (V) 48,500 cfm Combined Flow Rate Both Stacks

| Exhaust Concentrations | | | | Fractional | Formula | MW |
|---|---|---|---|---|---|---|
| H2S | 0.1 | ppm | 1,000,000 | 1.000E-07 | 2H + S | 34 |
| Carbonyl Sulfide | 1.0 | ppb | 1,000,000,000 | 1.000E-09 | C + O + S | 60 |
| Carbon Disulfide | 1.0 | ppb | 1,000,000,000 | 1.000E-09 | C + 2S | 76 |
| Ammonia | 0.3 | ppm | 1,000,000 | 3.000E-07 | 3H + N | 17 |

Ideal Gas Law PV = m/MW R T (m = P V MW / R / T)

0.7302 ft3-atm/deg.R-lbmol Ideal Gas Law Constant

68 deg.F Temperature
528 deg.R = (deg.F) + 460

1 atm Pressure

| | Both Stacks | | | Each Stack |
|---|---|---|---|---|
| Exhaust Mass Rates | lb/min | lb/hr | grams/sec | grams/sec |
| H2S | 4.277E-04 | 2.566E-02 | 3.233E-03 | 1.617E-03 |
| Carbonyl Sulfide | 7.548E-06 | 4.529E-04 | 5.706E-05 | 2.853E-05 |
| Carbon Disulfide | 9.560E-06 | 5.736E-04 | 7.228E-05 | 3.614E-05 |
| Ammonia | 6.416E-04 | 3.849E-02 | 4.850E-03 | 2.425E-03 |

**Uncontrolled and Controlled Mass Rates - Additional Biosolids Process (Drying, Thickening, and Dewatering) VOC & Air Toxics Estimates**

| | |
|---|---|
| Benchmark Exhaust Flow Rate (acfm) | 23,000 |
| Project Exhaust Flow Rate (acfm) | 19,500 |
| Benchmark Sludge Throughput (DTPD) | 6.8 |
| Project Nominal Sludge Throughput (DTPD) | 50 |
| Operating Hours per Year | 8,760 |
| Thermal Dryer Airflow (% of total airflow) | 33% |
| Remaining Process Airflow (% of total airflow) | 67% |
| Ratio of compound concentration for non-thermal dryer airflow portion | 1.3 |
| Total VOC Carbon Removal % | 90% |

| Volatile Organic Compounds (VOC) | CAS No. | Measured Concentration - Uncontrolled (ppbv) | MassDEP Air Toxic? | Molecular Weight (lb/lbmol) | Bench-mark Mass Rate (lb/hr) | Project Scaled Mass Rate (lb/hr)(3) | Biofilter Removal Efficiency (%) | BioFilter Controlled Project Scaled Mass Rate (lb/hr) | Carbon/Zeolite Polishing Removal Efficiency (%) | Total, Combined Removal Efficiency (max 99%) (%) (4) | Total Controlled Project Scaled Mass Rate (lb/hr) | Total Controlled Project Scaled Mass Rate (g/s) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Disulfide | 75-15-01 | 158 | Yes | 76.14 | 0.04306 | 0.1204 | 50% | 0.0602 | 85% | 92.5% | 0.009 | 0.0011 |
| Propene | 115-07-1 | 377 | Yes(1) | 42.08 | 0.05678 | 0.1587 | 0% | 0.1587 | 25% | 25.0% | 0.119 | 0.0150 |
| Chloromethane | 74-87-3 | 99.7 | No | 50.49 | 0.01802 | 0.0504 | 10% | 0.0453 | 25% | 32.5% | 0.034 | 0.0043 |
| Chloroethane | 75-00-3 | 2.5 | Yes | 64.51 | 0.00058 | 0.0016 | 10% | 0.0015 | 85% | 86.5% | 0.000 | 0.0000 |
| Ethanol | 64-17-5 | 69.5 | Yes | 46.07 | 0.01146 | 0.0320 | 95% | 0.0016 | 85% | 99.0% | 0.000 | 0.0000 |
| 2-propanol | 67-63-0 | 22 | No | 60.10 | 0.00473 | 0.0132 | 95% | 0.0007 | 85% | 99.0% | 0.000 | 0.0000 |
| 2-Propanone | 67-64-1 | 531 | Yes | 58.08 | 0.11039 | 0.3086 | 95% | 0.0154 | 25% | 96.3% | 0.012 | 0.0015 |
| Methyl Ethyl Ketone (2-Butanone) | 78-93-3 | 187 | Yes | 72.11 | 0.04827 | 0.1349 | 95% | 0.0067 | 85% | 99.0% | 0.001 | 0.0002 |
| Chloroform | 67-66-3 | 158 | Yes | 119.38 | 0.06751 | 0.1887 | 10% | 0.1699 | 85% | 86.5% | 0.025 | 0.0032 |
| Bromomethane | 74-83-9 | 30.6 | No | 94.94 | 0.01040 | 0.0291 | 10% | 0.0262 | 25% | 32.5% | 0.020 | 0.0025 |
| Bromodichloromethane | 75-27-4 | 5.39 | No | 163.8 | 0.00316 | 0.0088 | 10% | 0.0080 | 85% | 86.5% | 0.001 | 0.0002 |
| Heptane | 142-82-5 | 10.1 | Yes(1) | 100.21 | 0.00362 | 0.0101 | 50% | 0.0051 | 85% | 92.5% | 0.001 | 0.0001 |
| Benzene | 71-43-2 | 179 | Yes | 78.11 | 0.05005 | 0.1399 | 95% | 0.0070 | 85% | 99.0% | 0.001 | 0.0002 |
| Toluene | 108-88-3 | 220 | Yes | 92.14 | 0.07256 | 0.2028 | 95% | 0.0101 | 85% | 99.0% | 0.002 | 0.0003 |
| Ethylbenzene | 100-41-4 | 5.35 | Yes | 106.17 | 0.00203 | 0.0057 | 95% | 0.0003 | 85% | 99.0% | 0.000 | 0.0000 |
| p+m-Xylene | 106-42-3 &108-38-3 | 242 | Yes | 106.16 | 0.09196 | 0.2571 | 95% | 0.0129 | 85% | 99.0% | 0.003 | 0.0003 |
| o-Xylene | 95-47-6 | 4.07 | Yes | 106.16 | 0.00155 | 0.0043 | 95% | 0.0002 | 85% | 99.0% | 0.000 | 0.0000 |
| Styrene | 100-42-5 | 26.2 | Yes | 104.15 | 0.00977 | 0.0273 | 95% | 0.0014 | 85% | 99.0% | 0.000 | 0.0000 |
| 1,2,4-Trimethylbenzene | 95-63-6 | 3.3 | No | 120.19 | 0.00142 | 0.0040 | 95% | 0.0002 | 85% | 99.0% | 0.000 | 0.0000 |
| Chlorobenzene | 108-90-7 | 1.67 | Yes | 112.56 | 0.00067 | 0.0019 | 95% | 0.0001 | 85% | 99.0% | 0.000 | 0.0000 |
| Hexane | 110-54-3 | 8.8 | Yes(1) | 86.18 | 0.00271 | 0.0076 | 90% | 0.0008 | 85% | 98.5% | 0.000 | 0.0000 |
| Xylene (Total) | 1330-20-7 | 246 | Yes | 106.16 | 0.09348 | 0.2613 | 95% | 0.0131 | 85% | 99.0% | 0.003 | 0.0003 |
| Total Alkanes/Alkenes | NA | NA | Yes(1) | NA | 0.06312 | 0.1765 | NA | 0.1646 | NA | NA | 0.120 | 0.0151 |
| **TOTAL VOC (2)** | **NA** | **NA** | **NA** | **NA** | **0.50030** | **1.3987** | **NA** | **0.5167** | NA | 84.4% | **0.2177** | NA |

Note: (1) Alkanes/Alkenes not to exceed 25% n-hexane are listed as a MassDEP air toxic. Here sum of propene (an alkene) and heptane and hexane (alkanes).
Note: (2) Sum of all rows above less 2-propanone (acetone) which is not a VOC, and less xylene (total) and total alkanes/alkenes (to avoid double counting compounds)
Note: (3) Assumes that thermal dryer portion of the odor control airflow is extrapolated linearly based on the Project-to-Benchmark throughput ratio, and that emissions from the other process areas are 1.3 times the benchmark data
Note: (4) RTO or other equivalent control may be used instead of carbon/zeolite and biofilter combination. RTO use would result in lower impacts due to higher exhaust temperature, and for some compounds, higher removal efficiencies.

Example calculations (carbon disuflide):

m (benchmark) = P x V x MW / R / T = (158E-9) x (23,000 ft3/min) x (60 min/hr) x (76.14 lb/lbmol) / (0.7302 ft3-atm/lbmol-oR) / (68 oF + 460 oR) = 0.04306 lb/hr

m (scaled) = [((0.04306 lb/hr) x (50 DTPD) / (6.8 DTPD) x (33% dryer airflow)) + ((0.04306 lb/hr) x (1.3 scaleup ratio) x (67% non-dryer airflow))] * [(19,500 acfm) / (23,000 acfm)] = 0.1204 lb/hr

total control = [1 - ((1 - 50%) * (1-85%))] = 92.5% (not to exceed 99%)

m (scaled and controlled) = (0.1204 lb/hr) x (1 - 92.5%) = 0.009 lb/hr

m (scaled and controlled) = (0.009 lb/hr) x (453.6 g/lb) / (3,600 sec/hr) = 0.0011 g/s (with more significant figures shown 0.001138 g/s)

**Wet Scrubber Odor OU/s Rates**

| | | |
|---|---|---|
| Exhaust Flow Rate (V) | 19,500 | ft3/min |
| | 9.203 | m3/sec |
| | | |
| Uncontrolled Exhaust Concentration (D/T) | 9,883 | |
| Wet Scrubber Control Efficiency | 99% | |
| Controlled Exhaust Concentration (D/T) | 98.8 | |
| | | |
| Odor Emission Rate (OU/sec) | 909.6 | |

**Ionization Odor OU/s Rates**

| | | |
|---|---|---|
| Exhaust Flow Rate (V) - Each of Two Exhausts | 24,250 | ft3/min |
| | 11.45 | m3/sec |
| | | |
| Uncontrolled Exhaust Concentration (D/T) | 500 | |
| Wet Scrubber Control Efficiency | 90% | |
| Controlled Exhaust Concentration (D/T) | 50 | |
| | | |
| Odor Emission Rate (OU/sec) | 572.3 | |

Conversion Factors:

| | |
|---|---|
| 3.2808 | ft/meter |
| 60 | sec/min |

Example Calculations:

(24,250 ft3/min) / (3.2808 ft/meter)^3 / (60 sec/min) = 11.45 m3/sec

(500 D/T) x (1 - 90%) = 50 D/T

(11.45 m3/sec) x (50 D/T) = 572.5 OU/sec
(slight discrepancy due to rounding)

| | | | | | | |
|---|---|---|---|---|---|---|
| <u>Cooling Tower PM Emissions</u> | | | | | | |
| Circulation Rate | 900 | gpm each cell | | | | |
| Drift Rate | 0.0020% | | 99.9980% | | | |
| Drift | 0.018 | gpm | | | | |
| Water Density | 8.34 | lb/gal | | | | |
| Drift Rate | 9.0 | lb/hr | | | | |
| TDS Conc | 1,800 | ppm (mg/l) | | | | |
| Emission Rate | 0.016 | lb/hr | | | | |
| Emission Rate | 7.36 | g/hr | | | | |
| Emission Rate | 0.0710 | tpy | | | | |
| Emission Rate | 1.84 | g/hr per cell | | | | |
| Emission Rate | 0.000511 | g/s per cell | | | | |
| | | | | | | |
| | <u>Est Air Flow Per Fan</u> | | <u>Est Air Velocity Per Fan (check calc)</u> | | | |
| Air Flow Per Fan | 91,030 | ACFM | 91,000 | rounded result | | |
| # of Cells | 4 | cells | 4 | | | |
| Diameter | 9.75 | ft/cell | 9.75 | (117 inch fan diameter) | | |
| Surface Area | 74.66 | ft2 | 74.66 | | | |
| Air Velocity Per Fan | 20.32 | ft/s | **20.32** | | | |
| Air Velocity Per Fan | 6.19 | m/s | 6.19 | | | |
| | | | | | | |
| Circulation Rate | 900 | gpm | | | | |
| Drift Rate | 0.0020% | | | | | |
| Drift Loss | 0.018 | gpm | | | | |
| Water Density | 8.34 | lb/gal | | | | |
| Drift Rate | 9.0 | lb/hr | | | | |
| TDS Conc | 1,800 | ppm (mg/l) | | <u>PM2.5 < 12% total PM</u> | | |
| Emission Rate | 0.016 | lb/hr PM | | 0.0019 | lb/hr PM2.5 | |
| Emission Rate | 7.36 | g/hr PM | | 0.883 | g/hr pm2.5 | |
| Emission Rate | 0.0710 | tpy PM | | 0.00852 | tpy pm2.5 | |
| Emission Rate | 7.36 | g/hr PM per cell | | 0.883 | g/hr pm2.5 per cell | |
| Emission Rate | 0.00204 | g/s PM per cell | | 0.000245 | g/s pm2.5 per cell | |
| | | | | | | |
| Assume total PM is PM10 | | | | | | |
| | | | | | | |
| <u>Mass Emission Rates for All Cells</u> | | | | | | |
| # of Cells | 4 | | | | | |
| Emission Rate | 0.284 | TPY PM10 | | 0.0341 | TPY PM2.5 | |
| | | | | | | |
| Note: Inputs In grey | | | | | | |

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**PM-10, PM-2.5, Odor Emission Calculations and Stack Parameters for Parallel Products Transfer and MSW/Glass and Biosolids Processing Facility, New Bedford, MA.**

**Date** 8/12/2019
**Engineer** DTR / NRD(edits)
**Checked** DKB

**MSW Tipping - Particulate Matter**

1000 tons per day of total waste handling ( municipal solid waste)
500 tons per day of Category 2 C&D Residuals (bulkier C&D)
Total of 1,500 tons per day
From traffic study, 209 trucks in and out is worst case weekday volume including biosolids and glass, and ignoring rail transport out.

Facility accepts waste 7 days per week, 10 hours per day, limited to 362 days per year, so — 3620 hrs/yr of operation receiving
MSW Processing and C&D Residuals load out to rail cars up to 16 hours per day, 7 days per week. — 5792 hrs/yr of operation processing or loading

Loads are dumped on tipping floor from trucks (9 ton packers, 5.5 ton roll-off trucks, 4 ton roll-off containers, and self dumping live floor 100 CY, 28 ton trailers)

The MSW load is dumped and transferred via front end loader into a hopper for transfer via conveyor to processing.
The C&D load is dumped and transferred by front end loader to rail car to cover bales of MSW.

So, each ton of material is dumped (or loaded) twice and may othewise be handled (using front end loader or grapple for MSW) in the tipping floor area.
Processing of MSW will be calculated separately. Starting here with transfer and rail loadout.

Absent emission factors for MSW, assume all of the waste is C&D (conservative since C&D waste inherently dustier, as it includes drywall, wood, brick, concrete, etc)

| | |
|---|---|
| Transfer building is 250' x 225' x 40' H for a total volume of | 2,250,000 CF |
| Assume nominal three air changes per hour (2,250,000 CF x 3)/60 min/hr= | 112,500 acfm |
| Assume the transfer building will have four vents (52" dia x8' each) out of roof - each designed for 24,000 acfm (total of 96,000 acfm) | 96,000 acfm |
| Vent exit diameter: | 4.33 ft |
| Vent exit area: | 14.74 SF |
| Vent exit velocity: | 27 fps |

Air is pulled from the doors at front of building to the rear vents, creating a general flow across the working area
Place one vent over rail load out area, one over the hopper, and two in rear or tipping floor.

According to EPA AP-42, Section 13.2.3, Heavy Construction Operations (Table 13.2.3-1, Recommended Emission Factors for Construction Operations, under Construction Phase - Demolition and Debris Removal, Loading of Debris On-site or Unloading of Debris Offsite, this Table recommends the use of emission factor from Section 13.2.4)

Section 13.2.4 is called Aggregate Handling and Storage Piles, which includes material unloading from trucks onto piles and loading of trucks for shipment or transfer to process

E = k (0.0032) (U/5)^1.3 / (M/2)^1.4 - Equation (1) 13.2.4

where:

E = emission factor (lb/ton)
k = particle size multiplier (dimensionless); 0.35 for PM-10 (particles less than 10 microns in diameter), and 0.053 for PM-2.5
U = mean wind speed (mile/hr)
M = material moisture content (%)

E = 0.35 (0.0032) (U/5)^1.3 / (M/2)^1.4 (for PM10)

According to EPA, this emission factor is valid over a silt (% of particles less than 75 microns dia) content range of 0.44-19%, and a moisture content range of 0.25 -4.8%.

This equation will produce higher emissions with lower moisture content. Use the high end of range of 4.8% since MSW is typcially well above 20% moisture (Steam Chapter 29 Waste to Energy, Table 1 - Range of As Received Refuse Fuel Analysis)

While the unloading and loading occurs indoors, there is air movement caused by the ventilation system. This can be translated into a "wind speed" equivalent by dividing the volume of air flow, by the face area of the room normal to the exhaust pickups. the four vents in the tipping area exhausting 96,000 acfm.

Assume all of this volume is drawn across 225' wide area at tipping floor, and over an avg height of 20'

(96,000 ft^3/min) x (1/(225x20)) SF = 21 ft/min
21 ft/min x 60 min/hr x 1 mile/5280 ft = 0.24 mph

The low end of the range of wind speed for emission factor equation above is 1.3 mph - use this as a default value to account for any stray currents caused by localized air movement

E = 0.35 x 0.0032 x (1.3/5)^1.3 / ((4.8/2)^1.4) = 0.000057 lb/ton

0.000057 lb/ton x 1500 ton/day x 1/24 hr/day x 2 drops = 0.0071 lb/hr (24 hr avg) uncontrolled PM-10
(add controls further below)

For PM-2.5, the k multiplier is 0.053 instead of 0.35, apply to emission rate: 0.053/0.35 x 0.0071 = 0.00108 lb/hr uncontrolled

Next, consider pushing of material to piles or to hopper (double counts with a drop)- use bulldozing pushing

According to EPA AP-42, Section 13.2.3, Heavy Construction Operations (Table 13.2.3-1, Recommended Emission Factors for Construction Operations, under Construction Phase - Site Preparation - Bulldozing this Table recommends the use of emission factor from Section 11.9)

Section 11.9 is called Western Surface Coal Mining, and includes bulldozing overburden (dirt)

E = 1.0 x s^1.5/ M^1.4 - Table 11.9-1 PM-15

where:

E = emission factor (lb/hr)
s = material silt content (%)
M = material moisture content (%)

multiplier for PM-10 is 0.75 according to Table 11.9-1

According to EPA, this emission factor is valid over a silt (% of particles less than 75 microns dia) content range of 3.8-15.1%, and a moisture content range of 2.2-16.8%.

This equation will produce higher emissions with lower moisture content. The highest end of the range is 16.8%
Use a conservative silt content of 3.8% (higher than the 0.44% low end of range for the drop equation above)
Use a moderate moisture for mix of C&D and MSW, mostly MSW so say 500/1500 x 5% and 1000/1500x16.8%. — 12.9 % moisture

E = 1.0 x (3.8)^1.5 / ((12.9)^1.4) = 0.206 lb/hr PM-15
0.206 lb/hr x 0.75 = 0.155 lb/hr PM-10

Assume pushing occurs for all of a 10 hours shift.

0.155 lb/hr x 10 hr/day x 1/24 hr/day = 0.065 lb/hr 24-hr avg PM-10 uncontrolled

For PM-2.5, the multiplier is 0.105 instead of 0.75, apply to emission rate: 0.105/0.75 x 0.045 = 0.009 lb/hr uncontrolled

Total uncontrolled PM-10 emissions from dumping, loading, pushing (handling) of waste

| | PM-10 | PM-2.5 |
|---|---|---|
| 2 dumping actions | 0.007 | 0.001 lb/hr |
| 10 hours pushing | 0.065 | 0.009 lb/hr |
| Total | 0.072 | 0.010 lb/hr |

0.072 lb/hr x 24 hr/day x 362 day/yr/2000 lb/ton = **0.31 ton/yr** PM-10
0.010 lb/hr x 24 hr/day x 362 day/yr/2000 lb/ton = **0.04 ton/yr** PM-2.5

Sanity Check, stack test at UMW Holyoke in 2014 handling 750 tpd, including C&D found 0.17 lb/hr of PM-10 while operating
C&D is dustier than MSW — 0.17 lb/hr x 10 hr/day x 362 day/yr/2000 lb/ton = 0.31 ton/yr PM-10
Most of calculated emissions from pushing, and not directly related to tpd.

**Calculate PM-10 and PM-2.5 Emissions from Fugitive Dust generated by Trucks on Paved Roads (on-site)**

From EPA AP-42, Section 13.2.1 - Paved Roads

E = k (sL)^0.91 * (W)^1.02; Equation (1) - 13.2.1

where:

E = particulate emission factor (grams/vehicle mile traveled (g/VMT))
k = particle size multiplier; 1.0 g/VMT for PM-10 (particles less than 10 microns in diameter)
sL = road surface silt loading (grams per square meter)
W = average weight (tons) of vehicles traveling the road

According to EPA, this emission factor is valid over a silt (% of particles less than 75 microns dia) loading range of 0.03 - 400 g/m^2,
a mean vehicle weight of 2 - 42 tons, and a mean vehicle speed of 1 - 55 mph.

sL is from Table 13.2.1-2, for low volume roads (ADT < 500), use ubiquitous baseline value of 0.6 g/m^2
Even though the area is swept daily, to account for trackout waste floor, increase this to 2.4 g/M^2 (X4 as for winter baseline with anti skid abrasives)

| | No of Truck trips | Material Weight (tons) | Truck Weight (tons) | Total Weight (tons/truck) | Weighted average |
|---|---|---|---|---|---|
| MSW Packer Truck full | 27 | 9 | 3 | 12 | 0.66 |
| MSW Packer Truck empty | 27 | 0 | 3 | 3 | 0.16 |
| MSW Rolloff Compactor full | 4 | 6.5 | 3 | 10 | 0.08 |
| MSW Rolloff Compactor empty | 4 | 0 | 3 | 3 | 0.02 |
| MSW Rolloff full | 2 | 5.5 | 3 | 9 | 0.03 |
| MSW Rolloff empty | 2 | 0 | 3 | 3 | 0.01 |
| MSW Transfer Trailer full | 38 | 28.2 | 20 | 48 | 3.71 |
| MSW Transfer Trailer empty | 38 | 0 | 20 | 20 | 1.54 |
| MSW Outbound Trailers full | 54 | 28 | 20 | 48 | 5.25 |
| MSW Outbound Trailers empty | 54 | 0 | 20 | 20 | 2.19 |
| C&D Cat 2 Transfer Trailer full | 5 | 30 | 20 | 50 | 0.51 |
| C&D Cat 2 Transfer Trailer empty | 5 | 0 | 20 | 20 | 0.20 |
| Glass By Others (in) full | 3 | 32 | 20 | 52 | 0.32 |
| Glass By Others (in) empty | 3 | 0 | 20 | 20 | 0.12 |
| Glass Route Trucks (in) full | 45 | 3.5 | 3 | 7 | 0.59 |
| Glass Route Trucks (in) empty | 45 | 0 | 3 | 3 | 0.27 |
| Glass Outbound full | 5 | 32 | 20 | 52 | 0.53 |
| Glass Outbound empty | 5 | 0 | 20 | 20 | 0.20 |
| Glass Outbound full | 4 | 24 | 20 | 44 | 0.36 |
| Glass Outbound empty | 4 | 0 | 20 | 20 | 0.16 |
| Parallel Products Trips Full | 40 | 5.5 | 3 | 9 | 0.69 |
| Parallel Products Trips Empty | 40 | 0 | 3 | 3 | 0.24 |
| Biosolids Liquid full | 15 | 24 | 20 | 44 | 1.34 |
| Biosolids Liquid empty | 15 | 0 | 20 | 20 | 0.61 |
| Biosolids Cake full | 5 | 24 | 20 | 44 | 0.45 |
| Biosolids Cake empty | 5 | 0 | 20 | 20 | 0.20 |
| Total Truck Trips | 494 trips/day | | | | 20.43 |
| Total Trucks | 247 trucks/day | | | | |

E =1.0 x (2.4)^0.91 x (20.43) ^1.02 = 48.1 g/VMT
0.106 lb/VMT

Estimate each truck travels approximately 6200' total on-site which is 5600 ft for the primary loop and 600 ft from loop road to destination building and back 6200
Total daily PM-10 fugitive emissions: 247 x 6200/5280 x 0.106 lb/VMT 30.7 lb/day
**5.57 tons/yr PM-10**

For PM-2.5, the value of k is reduced to 0.25 X g/VMT, 12.0 g/VMT
0.03 lb/VMT
Factor down to PM-2.5: 0.25/1.0 x 5.57 ton/yr = **1.39 tons/yr PM-2.5**

**SUMMARY: MSW Tipping & Processing and Paved Roads**

| | | |
|---|---|---|
| Total PM from inside and outside of transfer building | 5.88 tons/yr | PM-10 |
| | 1.43 tons/yr | PM-2.5 |
| Assume same emissions from processing as for emissions from inside transfer building | 0.31 tons/yr | PM-10 |
| | 0.04 tons/yr | PM-2.5 |
| Total | **6.19 tons/yr** | **PM-10** |
| | **1.47 tons/yr** | **PM-2.5** |

**MSW Tipping & Processig Odor**
Odor from transfer and processing, initial bag break in transfer and metering bin.
Odor from organic fines as they move through processing.

Odor from Transfer Station
Use 96,000 ACFM at 50 D/T 45.3 M3/s (96,000 ft3/min/(60 sec/min x 35.3 ft3/m3)
Calculate OU/s 2265 OU/s 45.3 M3/s x 50 D/T
This is higher OU/s than the highest measured at NYC Transfer Stations in the summer time in 2004 Study, also from Epsilon confidential work at TS
Divide by 4 stacks **566.3 OU/s per stack**
PM-10 emission rate **0.0023 g/s per stack**
PM-2.5 emission rate **0.00032 g/s per stack**

Odor from Processing (assume same D/T as transfer)
Use 72,000 ACFM at 50 D/T 34.0 M3/s
Calculate OU/s 1699 OU/s
Divide by 3 stacks **566.3 OU/s per stack**

Assume processing has same PM emissions as transfer building , 3 stacks
PM-10 emission rate **0.0023 g/s per stack**
PM-2.5 emission rate **0.00032 g/s per stack**

**Ignore mobile source (truck and loader) engine PM emissions, also not currently modeling fugitives from road dust**

Assume 90% capture of PM and odor emissons that occur indoors in Transfer area the vents and other 10% exits thru open doors

Check air flow thru doors when open to see if negative pressure:
**Each door is 22' wide x 28 ' high**
Assume on average that 3 door open at a time , total open area is 3 x 22 x 28 = 1848 SF

From above, there are 96000 ACFM venting from the transfer tipping area air coming in thru the doors (may be more from the processing area connected to transfer area)
96,000/1848 = 52 fpm
From experience, this should be enough inflowing air velocity to capture more than 90% of the PM and odor emissions originating inside the building

| | | |
|---|---|---|
| Odor from Each Transfer stack at 90% capture | **509.7 OU/s per stack** | 4 stacks |
| PM-10 emission rate at 90% capture | **0.0020 g/s per stack** | |
| PM-2.5 emission rate at 90% capture | **0.00029 g/s per stack** | |
| Odor from doors (10%) | **226.5 OU/s from three doors total** | 10% of 4 stacks |
| PM-10 emission rate at doors (10%) | **0.000903 g/s from three doors total** | 10% of 4 stacks |
| PM-2.5 emission rate at doors (10%) | **0.000127 g/s from three doors total** | 10% of 4 stacks |
| Odor from Each Processing Stack | **566.3 OU/s per stack** | 3 stacks |
| PM-2.5 from Processing Stacks | **0.0023 g/s per stack** | |
| PM-10 from Processing Stacks | **0.00032 g/s per stack** | |

**Each of Seven Stacks**
**Stack exit diameter: 4.33 ft**
**Stack exit area: 14.74 SF**
**Stack exit velocity: 27.1 fps**

## Air Emissions Calculations

| Constants/Assumptions | |
|---|---|
| Daily Capacity [TPD] | 250 |
| Yearly Capacity [TPY] | 75,000 |
| Conversion [lb/ton] | 2,000 |
| Indoor (Building Enclosure) Control Efficiency | 90% |
| Primary Crushing % of total throughput | 100% |
| Secondary Crushing % of total throughput | 50% |
| 1.5 Screening % of total throughput | 250% |
| Ratio PM2.5/PM10 | 30% |

| Air Emissions Results (75,000 TPY Throughput) | | | | | | | Annual Average Emissions (8760 hours, 91,250 TPY Throughput) | |
|---|---|---|---|---|---|---|---|---|
| Location | $PM_{10}$ | $PM_{2.5}$ | $PM_{10}$ | $PM_{2.5}$ | $PM_{10}$ | $PM_{2.5}$ | $PM_{10}$ | $PM_{2.5}$ |
| | TPY | TPY | lb/hr | lb/hr | Max Hourly g/s | Max Hourly g/s | Annual Avg. g/s | Annual Avg. g/s |
| Process | 0.397 | 0.119 | 0.11 | 0.033 | 0.014 | 0.0042 | 0.014 | 0.0042 |
| Side Bunker | 0.00825 | 0.00248 | 0.010 | 0.0031 | 0.0013 | 0.00039 | 0.0003 | 0.00009 |
| Bunker | 0.00825 | 0.00248 | 0.010 | 0.0031 | 0.0013 | 0.00039 | 0.0003 | 0.00009 |
| Outdoor | 0.00375 | 0.00113 | 0.00104 | 0.000313 | 0.000131 | 0.0000394 | 0.000131 | 0.0000394 |
| **Total** | **0.417** | **0.125** | **0.132** | **0.040** | **0.0166** | **0.0050** | **0.0146** | **0.00438** |

*Annual Average g/s emission values are based on the total ton per year from the particular location converted to grams and divided by 8760 hr/yr and 3600 s/hr

| Model Inputs | | | | |
|---|---|---|---|---|
| **Source** | **Short Term Max** | | **Annual Average** | |
| | **PM10** | **PM2.5** | **PM10** | **PM2.5** |
| | g/s | g/s | g/s | g/s |
| Side Bunker Volume Source | 0.0013 | 0.00039 | 0.0003 | 0.00009 |
| Combined Volume Source | 0.015 | 0.0046 | 0.0143 | 0.0043 |
| **Total** | **0.0166** | **0.0050** | **0.0146** | **0.00438** |

| Air Emissions Calculations | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Number** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | |
| **Drop Description** | **Forklift to Sorting Conveyors** | **Sorting Conveyors to Sorted Unprocessed Bins** | **Front Loader to Process Line Conveyor** | **Conveyor to Cross Belt Magnet** | **Primary Crushing** | **Secondary Crushing** | **1.5 Screening** | **Sizing Screening** | **Final Product to Sorted or Reject Bunker** | **Front End Loader from Sorted Bunker to Train Hopper** | **Conveyor to Railcar** | **Total** |
| Location | Process | Side Bunker | Side Bunker | Process | Process | Process | Process | Process | Bunker | Bunker | Outdoor | |
| Handling Rate [TPH] | 10.4 | 10.4 | 83 | 10.4 | 10.4 | 5.21 | 26.0 | 10.4 | 10.4 | 83 | 10.4 | |
| Maximum Operating Hours [hr/yr] (a) | 7,200 | 7,200 | 900 | 7,200 | 7,200 | 7,200 | 7,200 | 7,200 | 7,200 | 900 | 7,200 | |
| Modeled Operating Hours [hr/yr] (b) | 8,760 | 8,760 | 1,095 | 8,760 | 8,760 | 8,760 | 8,760 | 8,760 | 8,760 | 1,095 | 8,760 | |
| Control Efficiency | 90% | 90% | 90% | 90% | 90% | 90% | 90% | 90% | 90% | 90% | 0% | |
| $PM_{10}$ Emissions Factor [lb/ton] | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.015 | 0.009 | 0.072 | 0.001 | 0.001 | 0.0001 | |
| $PM_{10}$ Emissions Uncontrolled [lb/hr] | 0.011 | 0.011 | 0.092 | 0.011 | 0.025 | 0.078 | 0.227 | 0.750 | 0.011 | 0.092 | 0.001 | |
| $PM_{10}$ Emissions Controlled [lb/hr] | 0.001 | 0.001 | 0.009 | 0.001 | 0.003 | 0.008 | 0.023 | 0.075 | 0.001 | 0.009 | 0.001 | |
| $PM_{10}$ Emissions Uncontrolled [TPY] | 0.041 | 0.041 | 0.041 | 0.041 | 0.090 | 0.281 | 0.816 | 2.700 | 0.041 | 0.041 | 0.004 | |
| **Maximum PM10 Emissions Controlled [TPY] (a)** | **0.004** | **0.004** | **0.004** | **0.004** | **0.009** | **0.028** | **0.082** | **0.270** | **0.004** | **0.004** | **0.004** | **0.417** |
| **Modeled PM10 Emissions Controlled [TPY] (b)** | **0.005** | **0.005** | **0.005** | **0.005** | **0.011** | **0.034** | **0.099** | **0.329** | **0.005** | **0.005** | **0.005** | **0.508** |
| $PM_{2.5}$ Emissions Uncontrolled [lb/hr] | 0.003 | 0.003 | 0.028 | 0.003 | 0.008 | 0.023 | 0.068 | 0.225 | 0.003 | 0.028 | 0.0003 | |
| $PM_{2.5}$ Emissions Controlled [lb/hr] | 0.0003 | 0.0003 | 0.0028 | 0.0003 | 0.0008 | 0.0023 | 0.0068 | 0.0225 | 0.0003 | 0.0028 | 0.0003 | |
| $PM_{2.5}$ Emissions Uncontrolled [TPY] | 0.012 | 0.012 | 0.012 | 0.012 | 0.027 | 0.084 | 0.245 | 0.810 | 0.012 | 0.012 | 0.001 | |
| $PM_{2.5}$ Emissions Controlled [TPY] | 0.001 | 0.001 | 0.001 | 0.001 | 0.003 | 0.008 | 0.024 | 0.081 | 0.001 | 0.001 | 0.001 | |
| **Maximum $PM_{2.5}$ Emissions Controlled [TPY] (a)** | **0.001** | **0.001** | **0.001** | **0.001** | **0.003** | **0.008** | **0.024** | **0.081** | **0.001** | **0.001** | **0.001** | **0.125** |
| **Modeled PM2.5 Emissions Controlled [TPY] (b)** | **0.002** | **0.002** | **0.002** | **0.002** | **0.003** | **0.010** | **0.030** | **0.099** | **0.002** | **0.002** | **0.001** | **0.152** |

Notes/Assumptions:
1. PM10 Emission factors for drops 1, 2, 3, 4, 9, and 10 were determined using table 11.19.2-2 of AP-42 Conveyor Transfer Point emissions factors.
2. PM10 Emission factors for drops 5 and 6 were determined using table 11.19.2-2 of AP-42 Tertiary and Fines Crushing emissions factors respectively.
3. PM10 Emission factors for drops 7 and 8 were determined using table 11.19.2-2 of AP-42 Screening and Fine Screening emissions factors respectively.
4. PM10 Emission factors for drop 11 was determined using table 11.19.2-2 of AP-42 Truck Loading - Conveyor, Crushed Stone emissions factors.
5. PM2.5 Emissions factors were not available through table 11.19.2-2 of AP-42 so a 30% PM2.5 to PM10 ratio was assumed for the sake of conservativeness.
6. Given the maximum operating throughput of 250 TPD and approximate operating time of 3 hr/day, the loader was assumed to operate at 83 TPH. This corresponds to 1 bucket load every 1.9 minutes, assuming each bucket is 2.7 tons.
(a) At 75,000 TPY and 250 TPD, the number of equivalent operating hours is 7,200. Annual PM2.5 air emissions impacts are estimated here for this maximum annual throughput scenario.
(b) Using 250 TPD and 8,760 annual operating hours per year, maximum modeled air emission rates are calculated. This is a conservative over estimate of annual emissions.

**MSW and Glass Front-End Loaders' Formaldehyde Emission Rate Estimates**

I. MOVES Emission Factors for Tractors/Loaders/Backhoes in grams per horsepower-hour (g/hp-hr)

| | |
|---|---|
| 3.61055 | Carbon Monoxide (CO) |
| 0.67710 | Total Hydrocarbons (THC) |
| 0.17776 | Formaldehyde (CH2O) |

II. Project Caterpillar Loader Specifications

| | | |
|---|---|---|
| Cat 966 M | 267 hp | Tier 4F |
| Cat 926 M | 155 hp | Was Tier 2 in EENF filing, now Tier 4F for DEIR filing |

Two 966's for the MSW operations and two 926's for the glass operations

III. Available Detailed Caterpillar Emissions Information

Cat Engine EM2776 Change Level 01 (Tier 4F) - Information from Data Sheet @ 2,200 RPM rated speed

| Load (%) | Load (hp) | Pollutant | grams/hr | g/hp-hr |
|---|---|---|---|---|
| 100% | 375 | CO | 23 | 0.06 |
| 100% | 375 | THC | 4 | 0.01 |
| 75% | 282 | CO | 23 | 0.08 |
| 75% | 282 | THC | 8 | 0.03 |
| 50% | 188 | CO | 17 | 0.09 |
| 50% | 188 | THC | 8 | 0.04 |
| 25% | 93.9 | CO | 12 | 0.13 |
| 25% | 93.9 | THC | 8 | 0.08 |
| 10% | 37.5 | CO | 11 | 0.28 |
| 10% | 37.5 | THC | 12 | 0.31 |

IV. Estimate Cat Engine EM2776 g/hp-hr at 21% Load

Using the data provided in Section III above, a curve fit was generated by plotting the data and using the trendline function in Excel. For both CO and THC, the best fit was a Power Curve as documented below. Note that the x variable refers to percent load as whole numbers (i.e. 25% load is x=25)

| CO | | |
|---|---|---|
| Type | $R^2$ | Formula |
| Exp | 0.8468 | y=0.2384e^-0.015x |
| Power | 0.9791 | y=1.1256x^-0.635 |
| Log | 0.9062 | y=-0.091ln(x)+0.463 |
| Poly n=2 | 0.885 | y=4E-05x^2-0.0067x+0.3152 |
| **THC** | | |
| Type | $R^2$ | Formula |
| Exp | 0.9203 | y=0.2808e^-0.033x |
| Power | 0.9562 | y=6.8259x^-1.342 |
| Log | 0.8538 | y=-0.123ln(x)+0.5464 |
| Poly n=2 | 0.8452 | y=6E-05x^2-0.0097x+0.3559 |

Using the Power Functions shown above the following emission factors were determined

| % Load | BHP | CO | THC |
|---|---|---|---|
| | | (g/hp-hr) | (g/hp-hr) |
| 21 | 78.75 | 0.163 | 0.115 |

V. Estimate Conservative Tier 4F Loader CH2O Emission Factors Using Ratio of THC

| Load (%) | MOVES CH2O (g/hp-hr) | MOVES THC (g/hp-hr) | Cat THC (g/hp-hr) | Derived Tier 4F CH2O (g/hp-hr) |
|---|---|---|---|---|
| 100% | 0.17776 | 0.67710 | 0.01 | 0.002625 |
| 21% | 0.17776 | 0.67710 | 0.115 | 0.03013 |
| 10% | 0.17776 | 0.67710 | 0.31 | 0.08138 |

e.g. (0.17776) / (0.67710) x (0.01) = 0.002625 g/hp-hr

VI. Estimate Conservative Tier 4F Loader CH2O Emission Rates Using Derived Emission Factors

| Loader Use | Load (%) | Load (hp) | Derived Tier 4F CH2O (g/hp-hr) |
|---|---|---|---|
| MSW | 100% | 267 | 0.002625 |
| MSW | 21% | 56.07 | 0.03013 |
| MSW | 10% | 26.7 | 0.08138 |
| Glass | 100% | 155 | 0.002625 |
| Glass | 21% | 32.55 | 0.03013 |
| Glass | 10% | 15.5 | 0.08138 |

Parallel Products

Mobile Source Emissions Analysis

Glass Processing Loaders Exhaust

Temporal Data

365.0 days/yr

Assumed Caterpillar 926M Waste Handler Small Wheel Loader

155 hp 0.21 Load Factor (from EPA-420-R-10-016 for SCC #2270002066)

Operating Schedule

2 number of loaders

3 hours each per day

6 hr/day 2 loaders at 3hr/day.

| | Oxides of Nitrogen (NOx) | Carbon Monoxide (CO) | Primary Exhaust PM10 - Total | Primary Exhaust PM2.5 - Total | Sulfur Dioxide (SO2) | CO2e |
|---|---|---|---|---|---|---|
| | g/hp-hr | | | | | |
| NONROAD (via MOVES) Emission Factor | | | | | | |
| Tractors/Loaders/Backhoes | 3.881832154 | 3.610552705 | 0.567440815 | 0.550417475 | 0.00404926 | |
| Tractors/Loaders/Backhoes TOG X SPECIATE Tier 2 | | | | | | |
| Tractors/Loaders/Backhoes TOG X SPECIATE Tier 4 | | | | | | |
| Tier Standards | | | | | | |
| Tier 3 Standards (100-175 hp) | 3.0 | | 0.22 | 0.22 | | |
| Tier 4 Standards (75-175 hp) | 0.3 | | 0.015 | 0.015 | | |
| AP-42 Table 3.3-1 | | | | | | |
| Diesel Fuel | 14.06 | 3.03 | 1.00 | 1.00 | 0.93 | 521.63 |

| Emissions | Oxides of Nitrogen (NOx) | Carbon Monoxide (CO) | Primary Exhaust PM10 - Total | Primary Exhaust PM2.5 - Total | Sulfur Dioxide (SO2) | CO2e |
|---|---|---|---|---|---|---|
| g/day | 58.59 | 705.14 | 2.9295 | 2.9295 | 0.79 | 101874.0 |
| lb/day | 0.13 | 1.55 | 0.01 | 0.01 | 0.00 | 224.60 |
| TPY | 0.02 | 0.28 | 0.00 | 0.00 | 0.00 | 40.99 |
| Annual (g/s) | 0.00068 | 0.00816 | 0.00003 | 0.00003 | 0.00001 | 1.17910 |
| over 24 hr work day (g/s) | 0.00068 | 0.00816 | 0.00003 | 0.00003 | 0.00001 | 1.17910 |
| Peak hour (g/s) | 0.00543 | 0.06529 | 0.00027 | 0.00027 | 0.00007 | 9.43278 |

Parallel Products
Mobile Source Emissions Analysis

Glass Processing Loaders Exhaust

Temporal Data

| | | | |
|---|---|---|---|
| | 365.0 | days/yr | |
| Assumed Caterpillar 926M Waste Handler Small Wheel Loader | | | |
| | 155 | hp | 0.21 |
| Operating Schedule | | | |
| | 2 | number of loaders | |
| | 3 | hours each per day | |
| | 6 | hr/day | 2 loaders at 3hr, |

| | 2-Methylnaphthalene | Benzene | Dichlorobenzene | Formaldehyde | Naphthalene | Toluene | Arsenic | Beryllium | Cadmium | Chromium | Copper | Lead | Mercury |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NONROAD (via MOVES) Emission Factor | | | | | | | | | | | | | |
| Tractors/Loaders/Backhoes | | 2.31E-02 | | 1.78E-01 | 3.19E-03 | 1.83E-02 | 1.04E-06 | | | 1.87E-08 | | | 1.39E-08 |
| Tractors/Loaders/Backhoes TOG X SPECIATE Tier 2 | | 3.92E-02 | | 2.06E-01 | | 2.65E-02 | | | | | | | |
| Tractors/Loaders/Backhoes TOG X SPECIATE Tier 4 | | 4.73E-03 | | 7.78E-02 | 5.43E-04 | 9.60E-03 | | | | | | | |
| Tier Standards | | | | | | | | | | | | | |
| Tier 3 Standards (100-175 hp) | | | | | | | | | | | | | |
| Tier 4 Standards (75-175 hp) | | | | 2.63E-03 | | | | | | | | | |
| AP-42 Table 3.3-1 | | | | | | | | | | | | | |
| Diesel Fuel | | | | | | | | | | | | | |

| Emissions | 2-Methylnaphthalene | Benzene | Dichlorobenzene | Formaldehyde | Naphthalene | Toluene | Arsenic | Beryllium | Cadmium | Chromium | Copper | Lead | Mercury |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| g/day | 0 | 4.51E+00 | 0 | 5.13E-01 | 1.06E-01 | 3.58E+00 | 2.04E-04 | 0 | 0.00E+00 | 3.65E-06 | 0 | 0 | 2.71E-06 |
| lb/day | 0 | 9.94E-03 | 0 | 1.13E-03 | 2.34E-04 | 7.90E-03 | 4.49E-07 | 0 | 0.00E+00 | 8.05E-09 | 0 | 0 | 5.97E-09 |
| TPY | 0 | 1.81E-03 | 0 | 2.06E-04 | 4.27E-05 | 1.44E-03 | 8.20E-08 | 0 | 0.00E+00 | 1.47E-09 | 0 | 0 | 1.09E-09 |
| Annual (g/s) | 0 | 5.22E-05 | 0 | 5.93E-06 | 1.23E-06 | 4.15E-05 | 2.36E-09 | 0 | 0.00E+00 | 4.23E-11 | 0 | 0 | 3.14E-11 |
| over 24 hr work day (g/s) | 0 | 5.22E-05 | 0 | 5.93E-06 | 1.23E-06 | 4.15E-05 | 2.36E-09 | 0 | 0.00E+00 | 4.23E-11 | 0 | 0 | 3.14E-11 |
| Peak hour (g/s) | 0 | 8.55E-05 | 0 | 1.41E-03 | 9.82E-06 | 1.74E-04 | 1.89E-08 | 0 | 0.00E+00 | 3.38E-10 | 0 | 0 | 2.51E-10 |

Parallel Products
Mobile Source Emissions Analysis

Glass Processing Loaders Exhaust

Temporal Data
365.0 days/yr
Assumed Caterpillar 926M Waste Handler Small Wheel Loader
155 hp 0.21
Operating Schedule
2 number of loaders
3 hours each per day
6 hr/day 2 loaders at 3hr,

| | Nickel | Selenium | Vanadium | Ethanol | 1,3-Butadiene | Acetaldehyde | Acrolein | Ammonia (NH3) | Ethyl Benzene | Hexane | Styrene | Xylene | Chloride |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NONROAD (via MOVES) Emission Factor | | | | | | | | | | | | | |
| Tractors/Loaders/Backhoes | | | | | 1.33E-03 | 6.28E-02 | 1.49E-02 | 5.40E-03 | 4.16E-03 | 1.43E-03 | | 1.32E-02 | |
| Tractors/Loaders/Backhoes TOG X SPECIATE Tier 2 | | | | | 1.44E-03 | 7.36E-02 | 1.31E-02 | | 3.00E-03 | | | 8.26E-03 | |
| Tractors/Loaders/Backhoes TOG X SPECIATE Tier 4 | | | | | 3.40E-04 | 2.60E-02 | 3.88E-03 | | 2.43E-03 | 1.83E-03 | | 1.31E-02 | |
| Tier Standards | | | | | | | | | | | | | |
| Tier 3 Standards (100-175 hp) | | | | | | | | | | | | | |
| Tier 4 Standards (75-175 hp) | | | | | | | | | | | | | |
| AP-42 Table 3.3-1 | | | | | | | | | | | | | |
| Diesel Fuel | | | | | | | | | | | | | |

| Emissions | Nickel | Selenium | Vanadium | Ethanol | 1,3-Butadiene | Acetaldehyde | Acrolein | Ammonia (NH3) | Ethyl Benzene | Hexane | Styrene | Xylene | Chloride |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| g/day | 0 | 0 | 0 | 0 | 6.64E-02 | 5.07E+00 | 2.91E+00 | 1.05E+00 | 4.76E-01 | 2.79E-01 | 0 | 2.58E+00 | 0 |
| lb/day | 0 | 0 | 0 | 0 | 1.46E-04 | 1.12E-02 | 6.43E-03 | 2.33E-03 | 1.05E-03 | 6.16E-04 | 0 | 5.68E-03 | 0 |
| TPY | 0 | 0 | 0 | 0 | 2.67E-05 | 2.04E-03 | 1.17E-03 | 4.24E-04 | 1.91E-04 | 1.12E-04 | 0 | 1.04E-03 | 0 |
| Annual (g/s) | 0 | 0 | 0 | 0 | 7.68E-07 | 5.87E-05 | 3.37E-05 | 1.22E-05 | 5.50E-06 | 3.23E-06 | 0 | 2.98E-05 | 0 |
| over 24 hr work day (g/s) | 0 | 0 | 0 | 0 | 7.68E-07 | 5.87E-05 | 3.37E-05 | 1.22E-05 | 5.50E-06 | 3.23E-06 | 0 | 2.98E-05 | 0 |
| Peak hour (g/s) | 0 | 0 | 0 | 0 | 6.15E-06 | 4.70E-04 | 7.02E-05 | 9.77E-05 | 4.40E-05 | 3.31E-05 | 0 | 2.37E-04 | 0 |

Parallel Products

Mobile Source Emissions Analysis

Glass Processing Loaders Exhaust

Temporal Data

365.0 days/yr

Assumed Caterpillar 926M Waste Handler Small Wheel Loader

155 hp 0.21

Operating Schedule

2 number of loaders

3 hours each per day

6 hr/day 2 loaders at 3hr,

| | Primary Exhaust PM2.5 - Total | Dioxins | Furans | Acetone | Methyl Ethyl Ketone |
|---|---|---|---|---|---|
| NONROAD (via MOVES) Emission Factor | | | | | |
| Tractors/Loaders/Backhoes | 5.50E-01 | 1.74E-11 | 1.17E-11 | | |
| Tractors/Loaders/Backhoes TOG X SPECIATE Tier 2 | | | | | 6.52E-03 |
| Tractors/Loaders/Backhoes TOG X SPECIATE Tier 4 | | | | 5.85E-03 | 1.23E-03 |
| Tier Standards | | | | | |
| Tier 3 Standards (100-175 hp) | 0.22 | | | | |
| Tier 4 Standards (75-175 hp) | | | | | |
| AP-42 Table 3.3-1 | | | | | |
| Diesel Fuel | | | | | |

| Emissions | Primary Exhaust PM2.5 - Total | Dioxins | Furans | Acetone | Methyl Ethyl Ketone |
|---|---|---|---|---|---|
| g/day | 1.07E+02 | 3.39E-09 | 2.29E-09 | 1.14E+00 | 2.40E-01 |
| lb/day | 2.37E-01 | 7.47E-12 | 5.04E-12 | 2.52E-03 | 5.29E-04 |
| TPY | 4.33E-02 | 1.36E-12 | 9.20E-13 | 4.60E-04 | 9.66E-05 |
| Annual (g/s) | 1.24E-03 | 3.92E-14 | 2.65E-14 | 1.32E-05 | 2.78E-06 |
| over 24 hr work day (g/s) | 1.24E-03 | 3.92E-14 | 2.65E-14 | 1.32E-05 | 2.78E-06 |
| Peak hour (g/s) | 3.98E-03 | 3.14E-13 | 2.12E-13 | 1.06E-04 | 2.22E-05 |

## Parallel Products
## Mobile Source Emissions Analysis

### MSW Tipping/Processing Loaders Exhaust

Temporal Data

365.0 days/yr

Assumed Two Caterpillar 966K Waste Handler Small Wheel Loader

267 hp 0.21 Load Factor (from EPA-420-R-10-016 for SCC #2270002066)

Operating Schedule

2 number of loaders

20 hours each per day

40 hr/day 2 operating together 16 hrs per day and 1 operating alone the other 8 hrs per day.

g/hp-hr

| | Oxides of Nitrogen (NOx) | Carbon Monoxide (CO) | Primary Exhaust PM10 - Total | Primary Exhaust PM2.5 - Total | Sulfur Dioxide (SO2) | CO2e |
|---|---|---|---|---|---|---|
| NONROAD (via MOVES) Emission Factor | | | | | | |
| Tractors/Loaders/Backhoes | 3.881832154 | 3.610552705 | 0.567440815 | 0.550417475 | 0.004049263 | |
| Tractors/Loaders/Backhoes TOG X SPECIATE Tier 2 | | | | | | |
| Tractors/Loaders/Backhoes TOG X SPECIATE Tier 4 | | | | | | |
| Tier Standards | | | | | | |
| Tier 3 Standards (175-300 hp) | 3.0 | | 0.15 | 0.15 | | |
| Tier 4 Standards (175-750 hp) | 0.3 | | 0.015 | 0.015 | | |
| AP-42 Table 3.3-1 | | | | | | |
| Diesel Fuel | 14.06 | 3.03 | 1.00 | 1.00 | 0.93 | 521.63 |

| Emissions | Oxides of Nitrogen (NOx) | Carbon Monoxide (CO) | Primary Exhaust PM10 - Total | Primary Exhaust PM2.5 - Total | Sulfur Dioxide (SO2) | CO2e |
|---|---|---|---|---|---|---|
| g/day | 672.84 | 8097.75 | 33.642 | 33.642 | 9.08 | 1169908.4 |
| lb/day | 1.48 | 17.85 | 0.07 | 0.07 | 0.02 | 2579.22 |
| TPY | 0.27 | 3.26 | 0.01 | 0.01 | 0.00 | 470.71 |
| Annual | 7.79E-03 | 0.0937 | 0.0004 | 0.0004 | 0.0001 | 13.5406 |
| 10% to open doors | 7.79E-04 | 0.0094 | 0.0000 | 0.0000 | 0.0000 | 1.3541 |
| 90% to exhaust vents | 7.01E-03 | 0.0844 | 0.0004 | 0.0004 | 0.0001 | 12.1865 |
| over 24 hr work day (g/s) | 7.79E-03 | 0.0937 | 0.0004 | 0.0004 | 0.0001 | 13.5406 |
| 10% to open doors | 7.79E-04 | 0.0094 | 0.0000 | 0.0000 | 0.0000 | 1.3541 |
| 90% to exhaust vents | 7.01E-03 | 0.0844 | 0.0004 | 0.0004 | 0.0001 | 12.1865 |
| Peak hour (g/s) | 9.35E-03 | 0.1125 | 0.0005 | 0.0005 | 0.0001 | 16.2487 |
| 10% to open doors | 9.35E-04 | 0.0112 | 0.0000 | 0.0000 | 0.0000 | 1.6249 |
| 90% to exhaust vents | 8.41E-03 | 0.1012 | 0.0004 | 0.0004 | 0.0001 | 14.6239 |

## Parallel Products
## Mobile Source Emissions Analysis

### MSW Tipping/Processing Loaders Exhaust

Temporal Data

| | | | |
|---|---|---|---|
| | 365.0 | days/yr | |
| Assumed Two Caterpillar 966K Waste Handler Small Wheel Loader | | | |
| | 267 | hp | 0.21 |
| Operating Schedule | | | |
| | 2 | number of loaders | |
| | 20 | hours each per day | |
| | 40 | hr/day | 2 operating toge |

| | 2-Methylnaphthalene | Benzene | Dichlorobenzene | Formaldehyde | Naphthalene | Toluene | Arsenic |
|---|---|---|---|---|---|---|---|
| NONROAD (via MOVES) Emission Factor | | | | | | | |
| Tractors/Loaders/Backhoes | | 2.31E-02 | | 1.78E-01 | 3.19E-03 | 1.83E-02 | 1.04E-06 |
| Tractors/Loaders/Backhoes TOG X SPECIATE Tier 2 | | 3.92E-02 | | 2.06E-01 | | 2.65E-02 | |
| Tractors/Loaders/Backhoes TOG X SPECIATE Tier 4 | | 4.73E-03 | | 7.78E-02 | 5.43E-04 | 9.60E-03 | |
| Tier Standards | | | | | | | |
| Tier 3 Standards (175-300 hp) | | | | | | | |
| Tier 4 Standards (175-750 hp) | | | | 2.63E-03 | | | |
| AP-42 Table 3.3-1 | | | | | | | |
| Diesel Fuel | | | | | | | |

| Emissions | 2-Methylnaphthalene | Benzene | Dichlorobenzene | Formaldehyde | Naphthalene | Toluene | Arsenic |
|---|---|---|---|---|---|---|---|
| g/day | 0 | 1.06E+01 | 0 | 5.89E+00 | 1.22E+00 | 2.15E+01 | 2.34E-03 |
| lb/day | 0 | 2.34E-02 | 0 | 1.30E-02 | 2.68E-03 | 4.74E-02 | 5.16E-06 |
| TPY | 0 | 4.27E-03 | 0 | 2.37E-03 | 4.90E-04 | 8.66E-03 | 9.42E-07 |
| | | | | | | | |
| Annual | 0 | 1.23E-04 | 0 | 6.81E-05 | 1.41E-05 | 2.49E-04 | 2.71E-08 |
| 10% to open doors | 0 | 1.23E-05 | 0 | 6.81E-06 | 1.41E-06 | 2.49E-05 | 2.71E-09 |
| 90% to exhaust vents | 0 | 1.10E-04 | 0 | 6.13E-05 | 1.27E-05 | 2.24E-04 | 2.44E-08 |
| | | | | | | | |
| over 24 hr work day (g/s) | 0 | 1.23E-04 | 0 | 6.81E-05 | 1.41E-05 | 2.49E-04 | 2.71E-08 |
| 10% to open doors | 0 | 1.23E-05 | 0 | 6.81E-06 | 1.41E-06 | 2.49E-05 | 2.71E-09 |
| 90% to exhaust vents | 0 | 1.10E-04 | 0 | 6.13E-05 | 1.27E-05 | 2.24E-04 | 2.44E-08 |
| | | | | | | | |
| Peak hour (g/s) | 0 | 1.47E-04 | 0 | 2.42E-03 | 1.69E-05 | 2.99E-04 | 3.25E-08 |
| 10% to open doors | 0 | 1.47E-05 | 0 | 2.42E-04 | 1.69E-06 | 2.99E-05 | 3.25E-09 |
| 90% to exhaust vents | 0 | 1.33E-04 | 0 | 2.18E-03 | 1.52E-05 | 2.69E-04 | 2.93E-08 |

# Parallel Products
# Mobile Source Emissions Analysis

## MSW Tipping/Processing Loaders Exhaust

| | | | | |
|---|---|---|---|---|
| Temporal Data | | | | |
| | 365.0 | days/yr | | |
| Assumed Two Caterpillar 966K Waste Handler Small Wheel Loader | | | | |
| | 267 | hp | | 0.21 |
| Operating Schedule | | | | |
| | 2 | number of loaders | | |
| | 20 | hours each per day | | |
| | 40 | hr/day | 2 operating toge | |

| | Beryllium | Cadmium | Chromium | Copper | Lead | Mercury | Nickel |
|---|---|---|---|---|---|---|---|
| NONROAD (via MOVES) Emission Factor | | | | | | | |
| Tractors/Loaders/Backhoes | | | 1.87E-08 | | | 1.39E-08 | |
| Tractors/Loaders/Backhoes TOG X SPECIATE Tier 2 | | | | | | | |
| Tractors/Loaders/Backhoes TOG X SPECIATE Tier 4 | | | | | | | |
| Tier Standards | | | | | | | |
| Tier 3 Standards (175-300 hp) | | | | | | | |
| Tier 4 Standards (175-750 hp) | | | | | | | |
| AP-42 Table 3.3-1 | | | | | | | |
| Diesel Fuel | | | | | | | |

| Emissions | Beryllium | Cadmium | Chromium | Copper | Lead | Mercury | Nickel |
|---|---|---|---|---|---|---|---|
| g/day | 0 | 0 | 4.19E-05 | 0 | 0 | 3.11E-05 | 0 |
| lb/day | 0 | 0 | 9.25E-08 | 0 | 0 | 6.86E-08 | 0 |
| TPY | 0 | 0 | 1.69E-08 | 0 | 0 | 1.25E-08 | 0 |
| Annual | 0 | 0 | 4.85E-10 | 0 | 0 | 3.60E-10 | 0 |
| 10% to open doors | 0 | 0 | 4.85E-11 | 0 | 0 | 3.60E-11 | 0 |
| 90% to exhaust vents | 0 | 0 | 4.37E-10 | 0 | 0 | 3.24E-10 | 0 |
| over 24 hr work day (g/s) | 0 | 0 | 4.85E-10 | 0 | 0 | 3.60E-10 | 0 |
| 10% to open doors | 0 | 0 | 4.85E-11 | 0 | 0 | 3.60E-11 | 0 |
| 90% to exhaust vents | 0 | 0 | 4.37E-10 | 0 | 0 | 3.24E-10 | 0 |
| Peak hour (g/s) | 0 | 0 | 5.83E-10 | 0 | 0 | 4.32E-10 | 0 |
| 10% to open doors | 0 | 0 | 5.83E-11 | 0 | 0 | 4.32E-11 | 0 |
| 90% to exhaust vents | 0 | 0 | 5.24E-10 | 0 | 0 | 3.89E-10 | 0 |

Parallel Products

Mobile Source Emissions Analysis

MSW Tipping/Processing Loaders Exhaust

Temporal Data

| | | | |
|---|---|---|---|
| | 365.0 | days/yr | |
| Assumed Two Caterpillar 966K Waste Handler Small Wheel Loader | | | |
| | 267 | hp | 0.21 |
| Operating Schedule | | | |
| | 2 | number of loaders | |
| | 20 | hours each per day | |
| | 40 | hr/day | 2 operating toge |

| | Selenium | Vanadium | Ethanol | 1,3-Butadiene | Acetaldehyde | Acrolein | Ammonia (NH3) |
|---|---|---|---|---|---|---|---|
| NONROAD (via MOVES) Emission Factor | | | | | | | |
| Tractors/Loaders/Backhoes | | | | 1.33E-03 | 6.28E-02 | 1.49E-02 | 5.40E-03 |
| Tractors/Loaders/Backhoes TOG X SPECIATE Tier 2 | | | | 1.44E-03 | 7.36E-02 | 1.31E-02 | |
| Tractors/Loaders/Backhoes TOG X SPECIATE Tier 4 | | | | 3.40E-04 | 2.60E-02 | 3.88E-03 | |
| Tier Standards | | | | | | | |
| Tier 3 Standards (175-300 hp) | | | | | | | |
| Tier 4 Standards (175-750 hp) | | | | | | | |
| AP-42 Table 3.3-1 | | | | | | | |
| Diesel Fuel | | | | | | | |

| Emissions | Selenium | Vanadium | Ethanol | 1,3-Butadiene | Acetaldehyde | Acrolein | Ammonia (NH3) |
|---|---|---|---|---|---|---|---|
| g/day | 0 | 0 | 0 | 7.62E-01 | 5.83E+01 | 8.70E+00 | 1.21E+01 |
| lb/day | 0 | 0 | 0 | 1.68E-03 | 1.28E-01 | 1.92E-02 | 2.67E-02 |
| TPY | 0 | 0 | 0 | 3.07E-04 | 2.34E-02 | 3.50E-03 | 4.87E-03 |
| Annual | 0 | 0 | 0 | 8.82E-06 | 6.74E-04 | 1.01E-04 | 1.40E-04 |
| 10% to open doors | 0 | 0 | 0 | 8.82E-07 | 6.74E-05 | 1.01E-05 | 1.40E-05 |
| 90% to exhaust vents | 0 | 0 | 0 | 7.94E-06 | 6.07E-04 | 9.07E-05 | 1.26E-04 |
| over 24 hr work day (g/s) | 0 | 0 | 0 | 8.82E-06 | 6.74E-04 | 1.01E-04 | 1.40E-04 |
| 10% to open doors | 0 | 0 | 0 | 8.82E-07 | 6.74E-05 | 1.01E-05 | 1.40E-05 |
| 90% to exhaust vents | 0 | 0 | 0 | 7.94E-06 | 6.07E-04 | 9.07E-05 | 1.26E-04 |
| Peak hour (g/s) | 0 | 0 | 0 | 1.06E-05 | 8.09E-04 | 1.21E-04 | 1.68E-04 |
| 10% to open doors | 0 | 0 | 0 | 1.06E-06 | 8.09E-05 | 1.21E-05 | 1.68E-05 |
| 90% to exhaust vents | 0 | 0 | 0 | 9.53E-06 | 7.28E-04 | 1.09E-04 | 1.51E-04 |

Parallel Products
Mobile Source Emissions Analysis

MSW Tipping/Processing Loaders Exhaust

Temporal Data
365.0 days/yr
Assumed Two Caterpillar 966K Waste Handler Small Wheel Loader
267 hp 0.21
Operating Schedule
2 number of loaders
20 hours each per day
40 hr/day 2 operating toge

| | Ethyl Benzene | Hexane | Styrene | Xylene | Chloride | Primary Exhaust PM2.5 - Total | Dioxins |
|---|---|---|---|---|---|---|---|
| NONROAD (via MOVES) Emission Factor | | | | | | | |
| Tractors/Loaders/Backhoes | 4.16E-03 | 1.43E-03 | | 1.32E-02 | | 5.50E-01 | 1.74E-11 |
| Tractors/Loaders/Backhoes TOG X SPECIATE Tier 2 | 3.00E-03 | | | 8.26E-03 | | | |
| Tractors/Loaders/Backhoes TOG X SPECIATE Tier 4 | 2.43E-03 | 1.83E-03 | | 1.31E-02 | | | |
| Tier Standards | | | | | | | |
| Tier 3 Standards (175-300 hp) | | | | | | 0.15 | |
| Tier 4 Standards (175-750 hp) | | | | | | 0.015 | |
| AP-42 Table 3.3-1 | | | | | | | |
| Diesel Fuel | | | | | | | |

| Emissions | Ethyl Benzene | Hexane | Styrene | Xylene | Chloride | Primary Exhaust PM2.5 - Total | Dioxins |
|---|---|---|---|---|---|---|---|
| g/day | 5.46E+00 | 4.11E+00 | 0 | 2.94E+01 | 0 | 3.36E+01 | 3.89E-08 |
| lb/day | 1.20E-02 | 9.06E-03 | 0 | 6.49E-02 | 0 | 7.42E-02 | 8.58E-11 |
| TPY | 2.20E-03 | 1.65E-03 | 0 | 1.18E-02 | 0 | 1.35E-02 | 1.57E-11 |
| Annual | 6.32E-05 | 4.76E-05 | 0 | 3.40E-04 | 0 | 3.89E-04 | 4.50E-13 |
| 10% to open doors | 6.32E-06 | 4.76E-06 | 0 | 3.40E-05 | 0 | 3.89E-05 | 4.50E-14 |
| 90% to exhaust vents | 5.69E-05 | 4.28E-05 | 0 | 3.06E-04 | 0 | 3.50E-04 | 4.05E-13 |
| over 24 hr work day (g/s) | 6.32E-05 | 4.76E-05 | 0 | 3.40E-04 | 0 | 3.89E-04 | 4.50E-13 |
| 10% to open doors | 6.32E-06 | 4.76E-06 | 0 | 3.40E-05 | 0 | 3.89E-05 | 4.50E-14 |
| 90% to exhaust vents | 5.69E-05 | 4.28E-05 | 0 | 3.06E-04 | 0 | 3.50E-04 | 4.05E-13 |
| Peak hour (g/s) | 7.58E-05 | 5.71E-05 | 0 | 4.09E-04 | 0 | 4.67E-03 | 5.40E-13 |
| 10% to open doors | 7.58E-06 | 5.71E-06 | 0 | 4.09E-05 | 0 | 4.67E-04 | 5.40E-14 |
| 90% to exhaust vents | 6.83E-05 | 5.14E-05 | 0 | 3.68E-04 | 0 | 4.21E-03 | 4.86E-13 |

Parallel Products

Mobile Source Emissions Analysis

MSW Tipping/Processing Loaders Exhaust

Temporal Data

| | | | |
|---|---|---|---|
| | 365.0 | days/yr | |
| Assumed Two Caterpillar 966K Waste Handler Small Wheel Loader | | | |
| | 267 | hp | 0.21 |
| Operating Schedule | | | |
| | 2 | number of loaders | |
| | 20 | hours each per day | |
| | 40 | hr/day | 2 operating toge |

| | Furans | Acetone | Methyl Ethyl Ketone |
|---|---|---|---|
| NONROAD (via MOVES) Emission Factor | | | |
| Tractors/Loaders/Backhoes | 1.17E-11 | | |
| Tractors/Loaders/Backhoes TOG X SPECIATE Tier 2 | | | 6.52E-03 |
| Tractors/Loaders/Backhoes TOG X SPECIATE Tier 4 | | 5.85E-03 | 1.23E-03 |
| Tier Standards | | | |
| Tier 3 Standards (175-300 hp) | | | |
| Tier 4 Standards (175-750 hp) | | | |
| AP-42 Table 3.3-1 | | | |
| Diesel Fuel | | | |

| Emissions | Furans | Acetone | Methyl Ethyl Ketone |
|---|---|---|---|
| g/day | 2.63E-08 | 1.31E+01 | 2.76E+00 |
| lb/day | 5.79E-11 | 2.89E-02 | 6.08E-03 |
| TPY | 1.06E-11 | 5.28E-03 | 1.11E-03 |
| | | | |
| Annual | 3.04E-13 | 1.52E-04 | 3.19E-05 |
| 10% to open doors | 3.04E-14 | 1.52E-05 | 3.19E-06 |
| 90% to exhaust vents | 2.74E-13 | 1.37E-04 | 2.87E-05 |
| | | | |
| over 24 hr work day (g/s) | 3.04E-13 | 1.52E-04 | 3.19E-05 |
| 10% to open doors | 3.04E-14 | 1.52E-05 | 3.19E-06 |
| 90% to exhaust vents | 2.74E-13 | 1.37E-04 | 2.87E-05 |
| | | | |
| Peak hour (g/s) | 3.65E-13 | 1.82E-04 | 3.83E-05 |
| 10% to open doors | 3.65E-14 | 1.82E-05 | 3.83E-06 |
| 90% to exhaust vents | 3.28E-13 | 1.64E-04 | 3.45E-05 |

# Parallel Products
# Mobile Source Emissions Analysis

## Truck Emissions At Idling Points at Facility

MOVES Emission Factors

| | CO2E | CO | NOX | PM10 | PM2.5 | SO2 | VOC |
|---|---|---|---|---|---|---|---|
| 0 mph | 7621.92 | 10.86238 | 37.46117 | 2.51465 | 2.31347 | 0.064505 | 3.977264 |

ONSITE

| Idling Times | Idle Minutes Per Truck | Idle Hours per Truck | Peak Hour Trucks | Idling time ((veh-hr)/hr) [1] |
|---|---|---|---|---|
| Truck Exhaust Inbound Scale | 2 | 0.0333 | 24 | 0.800 |
| Truck Exhaust Pause Area (Stop) 1 | 2 | 0.0333 | | 0.800 |
| Truck Exhaust Pause Area (Stop) 2 | 2 | 0.0333 | | 0.800 |
| Truck Exhaust Outbound Scale | 2 | 0.0333 | | 0.800 |

[1] vehicle hours of delay (idle) per hour of actual time

Emissions (g/hr)

| | CO2E | NOX | CO | PM10 | PM2.5 | SO2 | VOC |
|---|---|---|---|---|---|---|---|
| Truck Exhaust Inbound Scale | 6097.8 | 30.0 | 8.7 | 2.0 | 1.9 | 0.1 | 3.2 |
| Truck Exhaust Pause Area (Stop) 1 | 6097.8 | 30.0 | 8.7 | 2.0 | 1.9 | 0.1 | 3.2 |
| Truck Exhaust Pause Area (Stop) 2 | 6097.8 | 30.0 | 8.7 | 2.0 | 1.9 | 0.1 | 3.2 |
| Truck Exhaust Outbound Scale | 6097.8 | 30.0 | 8.7 | 2.0 | 1.9 | 0.1 | 3.2 |

AERMOD Emissions (g/s)

| | CO2E | NOX | CO | PM10 | PM2.5 | SO2 | VOC |
|---|---|---|---|---|---|---|---|
| Truck Exhaust Inbound Scale | 1.69E+00 | 8.33E-03 | 2.41E-03 | 5.59E-04 | 5.14E-04 | 1.43E-05 | 8.84E-04 |
| Truck Exhaust Pause Area (Stop) 1 | 1.69E+00 | 8.33E-03 | 2.41E-03 | 5.59E-04 | 5.14E-04 | 1.43E-05 | 8.84E-04 |
| Truck Exhaust Pause Area (Stop) 2 | 1.69E+00 | 8.33E-03 | 2.41E-03 | 5.59E-04 | 5.14E-04 | 1.43E-05 | 8.84E-04 |
| Truck Exhaust Outbound Scale | 1.69E+00 | 8.33E-03 | 2.41E-03 | 5.59E-04 | 5.14E-04 | 1.43E-05 | 8.84E-04 |

OFFSITE

| Idling Times | AM Peak Delay Time (s/veh) | PM Peak Delay Time (s/veh) | Average Delay (min/veh) [1] | Average Delay (hr/veh) | Peak Hour Trucks (veh/hr) | All Truck Idling time ((veh-hr)/hr) [2] |
|---|---|---|---|---|---|---|
| Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road | 111.7 | 107.4 | 0.603 | 0.0100 | 48 | 0.482 |
| Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road | 42.2 | 145.7 | 0.517 | 0.0086 | 48 | 0.413 |
| Phillips Road & Theodore Rice Boulevard/Braley Road | 80.8 | 140.1 | 0.607 | 0.0101 | 48 | 0.486 |
| Duchaine Boulevard & Theodore Rice Boulevard | 8.9 | 9.7 | 0.051 | 0.0009 | 48 | 0.041 |
| Duchaine Boulevard & Samuel Barnet Boulevard | 1.2 | 4 | 0.014 | 0.0002 | 48 | 0.011 |
| Phillips Road & Samuel Barnet Boulevard | 4.9 | 8.6 | 0.037 | 0.0006 | 0 | 0.000 |

[1] uses factor of 33% to conservatively account for conversion of SYNCHRO Peak Hours to hourly traffic distribution.

[2] hours of delay (idle) for all vehicle per hour of actual time

Emissions (g/hr)

| | CO2E | NOX | CO | PM10 | PM2.5 | SO2 | VOC |
|---|---|---|---|---|---|---|---|
| Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road | 3674.1 | 1.81E+01 | 5.24E+00 | 1.21E+00 | 1.12E+00 | 3.11E-02 | 1.92E+00 |
| Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road | 3150.9 | 1.55E+01 | 4.49E+00 | 1.04E+00 | 9.56E-01 | 2.67E-02 | 1.64E+00 |
| Phillips Road & Theodore Rice Boulevard/Braley Road | 3704.3 | 1.82E+01 | 5.28E+00 | 1.22E+00 | 1.12E+00 | 3.13E-02 | 1.93E+00 |
| Duchaine Boulevard & Theodore Rice Boulevard | 311.9 | 1.53E+00 | 4.45E-01 | 1.03E-01 | 9.47E-02 | 2.64E-03 | 1.63E-01 |
| Duchaine Boulevard & Samuel Barnet Boulevard | 87.2 | 4.29E-01 | 1.24E-01 | 2.88E-02 | 2.65E-02 | 7.38E-04 | 4.55E-02 |
| Phillips Road & Samuel Barnet Boulevard | 0.0 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

AERMOD Emissions (g/s)

| | CO2E | NOX | CO | PM10 | PM2.5 | SO2 | VOC |
|---|---|---|---|---|---|---|---|
| Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road | 1.02E+00 | 5.02E-03 | 1.45E-03 | 3.37E-04 | 3.10E-04 | 8.64E-06 | 5.33E-04 |
| Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road | 8.75E-01 | 4.30E-03 | 1.25E-03 | 2.89E-04 | 2.66E-04 | 7.41E-06 | 4.57E-04 |
| Phillips Road & Theodore Rice Boulevard/Braley Road | 1.03E+00 | 5.06E-03 | 1.47E-03 | 3.39E-04 | 3.12E-04 | 8.71E-06 | 5.37E-04 |
| Duchaine Boulevard & Theodore Rice Boulevard | 8.66E-02 | 4.26E-04 | 1.23E-04 | 2.86E-05 | 2.63E-05 | 7.33E-07 | 4.52E-05 |
| Duchaine Boulevard & Samuel Barnet Boulevard | 2.42E-02 | 1.19E-04 | 3.45E-05 | 7.99E-06 | 7.35E-06 | 2.05E-07 | 1.26E-05 |
| Phillips Road & Samuel Barnet Boulevard | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

# Parallel Products
# Mobile Source Emissions Analysis

## Truck Emissions At Idling Points at Facility

MOVES Emission Factors

| | Benzene | Ethanol | Naphthalene (total) | 1,3-Butadiene | Formaldehyde | Acetaldehyde | Acrolein | Ammonia (NH3) | Ethyl Benzene | Hexane |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 mph | 2.12E-03 | 0.00E+00 | 3.90E-02 | 1.01E-02 | 3.81E-01 | 1.56E-01 | 2.75E-02 | 3.77E-01 | 1.27E-02 | 1.08E-02 |

ONSITE

Idling Times
- Truck Exhaust Inbound Scale
- Truck Exhaust Pause Area (Stop) 1
- Truck Exhaust Pause Area (Stop) 2
- Truck Exhaust Outbound Scale

(1) vehicle hours of delay (idle) per hour of actual time

Emissions (g/hr)

| | Benzene | Ethanol | Naphthalene (total) | 1,3-Butadiene | Formaldehyde | Acetaldehyde | Acrolein | Ammonia (NH3) | Ethyl Benzene | Hexane |
|---|---|---|---|---|---|---|---|---|---|---|
| Truck Exhaust Inbound Scale | 1.69E-03 | 0.00E+00 | 3.12E-02 | 8.05E-03 | 3.04E-01 | 1.25E-01 | 2.20E-02 | 3.01E-01 | 1.01E-02 | 8.64E-03 |
| Truck Exhaust Pause Area (Stop) 1 | 1.69E-03 | 0.00E+00 | 3.12E-02 | 8.05E-03 | 3.04E-01 | 1.25E-01 | 2.20E-02 | 3.01E-01 | 1.01E-02 | 8.64E-03 |
| Truck Exhaust Pause Area (Stop) 2 | 1.69E-03 | 0.00E+00 | 3.12E-02 | 8.05E-03 | 3.04E-01 | 1.25E-01 | 2.20E-02 | 3.01E-01 | 1.01E-02 | 8.64E-03 |
| Truck Exhaust Outbound Scale | 1.69E-03 | 0.00E+00 | 3.12E-02 | 8.05E-03 | 3.04E-01 | 1.25E-01 | 2.20E-02 | 3.01E-01 | 1.01E-02 | 8.64E-03 |

AERMOD Emissions (g/s)

| | Benzene | Ethanol | Naphthalene (total) | 1,3-Butadiene | Formaldehyde | Acetaldehyde | Acrolein | Ammonia (NH3) | Ethyl Benzene | Hexane |
|---|---|---|---|---|---|---|---|---|---|---|
| Truck Exhaust Inbound Scale | 4.71E-07 | 0.00E+00 | 8.67E-06 | 2.24E-06 | 8.46E-05 | 3.47E-05 | 6.10E-06 | 8.37E-05 | 2.82E-06 | 2.40E-06 |
| Truck Exhaust Pause Area (Stop) 1 | 4.71E-07 | 0.00E+00 | 8.67E-06 | 2.24E-06 | 8.46E-05 | 3.47E-05 | 6.10E-06 | 8.37E-05 | 2.82E-06 | 2.40E-06 |
| Truck Exhaust Pause Area (Stop) 2 | 4.71E-07 | 0.00E+00 | 8.67E-06 | 2.24E-06 | 8.46E-05 | 3.47E-05 | 6.10E-06 | 8.37E-05 | 2.82E-06 | 2.40E-06 |
| Truck Exhaust Outbound Scale | 4.71E-07 | 0.00E+00 | 8.67E-06 | 2.24E-06 | 8.46E-05 | 3.47E-05 | 6.10E-06 | 8.37E-05 | 2.82E-06 | 2.40E-06 |

OFFSITE

Idling Times

| | | |
|---|---|---|
| Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road | North Route | 100% |
| Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road | | |
| Phillips Road & Theodore Rice Boulevard/Braley Road | | |
| Duchaine Boulevard & Theodore Rice Boulevard | | |
| Duchaine Boulevard & Samuel Barnet Boulevard | | |
| Phillips Road & Samuel Barnet Boulevard | South Route | 0% |

(1) uses factor of 33% to conservatively account for conversion of SYNCHR

(2) hours of delay (idle) for all vehicle per hour of actual time

Emissions (g/hr)

| | Benzene | Ethanol | Naphthalene (total) | 1,3-Butadiene | Formaldehyde | Acetaldehyde | Acrolein | Ammonia (NH3) | Ethyl Benzene | Hexane |
|---|---|---|---|---|---|---|---|---|---|---|
| Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road | 1.02E-03 | 0.00E+00 | 1.88E-02 | 4.85E-03 | 1.83E-01 | 7.53E-02 | 1.32E-02 | 1.82E-01 | 6.12E-03 | 5.21E-03 |
| Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road | 8.75E-04 | 0.00E+00 | 1.61E-02 | 4.16E-03 | 1.57E-01 | 6.46E-02 | 1.14E-02 | 1.56E-01 | 5.24E-03 | 4.47E-03 |
| Phillips Road & Theodore Rice Boulevard/Braley Road | 1.03E-03 | 0.00E+00 | 1.90E-02 | 4.89E-03 | 1.85E-01 | 7.60E-02 | 1.33E-02 | 1.83E-01 | 6.17E-03 | 5.25E-03 |
| Duchaine Boulevard & Theodore Rice Boulevard | 8.67E-05 | 0.00E+00 | 1.60E-03 | 4.12E-04 | 1.56E-02 | 6.40E-03 | 1.12E-03 | 1.54E-02 | 5.19E-04 | 4.42E-04 |
| Duchaine Boulevard & Samuel Barnet Boulevard | 2.42E-05 | 0.00E+00 | 4.47E-04 | 1.15E-04 | 4.35E-03 | 1.79E-03 | 3.14E-04 | 4.31E-03 | 1.45E-04 | 1.24E-04 |
| Phillips Road & Samuel Barnet Boulevard | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

AERMOD Emissions (g/s)

| | Benzene | Ethanol | Naphthalene (total) | 1,3-Butadiene | Formaldehyde | Acetaldehyde | Acrolein | Ammonia (NH3) | Ethyl Benzene | Hexane |
|---|---|---|---|---|---|---|---|---|---|---|
| Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road | 2.84E-07 | 0.00E+00 | 5.23E-06 | 1.35E-06 | 5.10E-05 | 2.09E-05 | 3.68E-06 | 5.04E-05 | 1.70E-06 | 1.45E-06 |
| Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road | 2.43E-07 | 0.00E+00 | 4.48E-06 | 1.16E-06 | 4.37E-05 | 1.79E-05 | 3.15E-06 | 4.32E-05 | 1.46E-06 | 1.24E-06 |
| Phillips Road & Theodore Rice Boulevard/Braley Road | 2.86E-07 | 0.00E+00 | 5.27E-06 | 1.36E-06 | 5.14E-05 | 2.11E-05 | 3.71E-06 | 5.08E-05 | 1.71E-06 | 1.46E-06 |
| Duchaine Boulevard & Theodore Rice Boulevard | 2.41E-08 | 0.00E+00 | 4.44E-07 | 1.14E-07 | 4.33E-06 | 1.78E-06 | 3.12E-07 | 4.28E-06 | 1.44E-07 | 1.23E-07 |
| Duchaine Boulevard & Samuel Barnet Boulevard | 6.73E-09 | 0.00E+00 | 1.24E-07 | 3.20E-08 | 1.21E-06 | 4.97E-07 | 8.73E-08 | 1.20E-06 | 4.03E-08 | 3.43E-08 |
| Phillips Road & Samuel Barnet Boulevard | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

# Parallel Products
## Mobile Source Emissions Analysis

### Truck Emissions At Idling Points at Facility

MOVES Emission Factors

| | Styrene | Toluene | Xylene | Chloride | Mercury (total) | Arsenic Compounds | Chromium 6+ | Nickel Compounds | Exhaust PM2.5 - Total | Dioxins |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 mph | 1.41E-03 | 3.29E-02 | 3.54E-02 | 1.11E-02 | 6.63E-06 | 1.39E-03 | 5.37E-06 | 2.15E-03 | 2.31E+00 | 6.10E-09 |

ONSITE

Idling Times
- Truck Exhaust Inbound Scale
- Truck Exhaust Pause Area (Stop) 1
- Truck Exhaust Pause Area (Stop) 2
- Truck Exhaust Outbound Scale

(1) vehicle hours of delay (idle) per hour of actual time

Emissions (g/hr)

| | Styrene | Toluene | Xylene | Chloride | Mercury (total) | Arsenic Compounds | Chromium 6+ | Nickel Compounds | Primary Exhaust PM2.5 - Total | Dioxins |
|---|---|---|---|---|---|---|---|---|---|---|
| Truck Exhaust Inbound Scale | 1.13E-03 | 2.63E-02 | 2.83E-02 | 8.89E-03 | 5.30E-06 | 1.11E-03 | 4.30E-06 | 1.72E-03 | 1.85E+00 | 4.88E-09 |
| Truck Exhaust Pause Area (Stop) 1 | 1.13E-03 | 2.63E-02 | 2.83E-02 | 8.89E-03 | 5.30E-06 | 1.11E-03 | 4.30E-06 | 1.72E-03 | 1.85E+00 | 4.88E-09 |
| Truck Exhaust Pause Area (Stop) 2 | 1.13E-03 | 2.63E-02 | 2.83E-02 | 8.89E-03 | 5.30E-06 | 1.11E-03 | 4.30E-06 | 1.72E-03 | 1.85E+00 | 4.88E-09 |
| Truck Exhaust Outbound Scale | 1.13E-03 | 2.63E-02 | 2.83E-02 | 8.89E-03 | 5.30E-06 | 1.11E-03 | 4.30E-06 | 1.72E-03 | 1.85E+00 | 4.88E-09 |

AERMOD Emissions (g/s)

| | Styrene | Toluene | Xylene | Chloride | Mercury (total) | Arsenic Compounds | Chromium 6+ | Nickel Compounds | Primary Exhaust PM2.5 - Total | Dioxins |
|---|---|---|---|---|---|---|---|---|---|---|
| Truck Exhaust Inbound Scale | 3.14E-07 | 7.31E-06 | 7.86E-06 | 2.47E-06 | 1.47E-09 | 3.08E-07 | 1.19E-09 | 4.79E-07 | 5.14E-04 | 1.36E-12 |
| Truck Exhaust Pause Area (Stop) 1 | 3.14E-07 | 7.31E-06 | 7.86E-06 | 2.47E-06 | 1.47E-09 | 3.08E-07 | 1.19E-09 | 4.79E-07 | 5.14E-04 | 1.36E-12 |
| Truck Exhaust Pause Area (Stop) 2 | 3.14E-07 | 7.31E-06 | 7.86E-06 | 2.47E-06 | 1.47E-09 | 3.08E-07 | 1.19E-09 | 4.79E-07 | 5.14E-04 | 1.36E-12 |
| Truck Exhaust Outbound Scale | 3.14E-07 | 7.31E-06 | 7.86E-06 | 2.47E-06 | 1.47E-09 | 3.08E-07 | 1.19E-09 | 4.79E-07 | 5.14E-04 | 1.36E-12 |

OFFSITE

Idling Times
- Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road
- Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road
- Phillips Road & Theodore Rice Boulevard/Braley Road
- Duchaine Boulevard & Theodore Rice Boulevard
- Duchaine Boulevard & Samuel Barnet Boulevard
- Phillips Road & Samuel Barnet Boulevard

(1) uses factor of 33% to conservatively account for conversion of SYNCHR

(2) hours of delay (idle) for all vehicle per hour of actual time

Emissions (g/hr)

| | Styrene | Toluene | Xylene | Chloride | Mercury (total) | Arsenic Compounds | Chromium 6+ | Nickel Compounds | Primary Exhaust PM2.5 - Total | Dioxins |
|---|---|---|---|---|---|---|---|---|---|---|
| Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road | 6.80E-04 | 1.58E-02 | 1.70E-02 | 5.36E-03 | 3.19E-06 | 6.68E-04 | 2.59E-06 | 1.04E-03 | 1.12E+00 | 2.94E-09 |
| Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road | 5.83E-04 | 1.36E-02 | 1.46E-02 | 4.60E-03 | 2.74E-06 | 5.73E-04 | 2.22E-06 | 8.91E-04 | 9.56E-01 | 2.52E-09 |
| Phillips Road & Theodore Rice Boulevard/Braley Road | 6.86E-04 | 1.60E-02 | 1.72E-02 | 5.40E-03 | 3.22E-06 | 6.73E-04 | 2.61E-06 | 1.05E-03 | 1.12E+00 | 2.97E-09 |
| Duchaine Boulevard & Theodore Rice Boulevard | 5.77E-05 | 1.35E-03 | 1.45E-03 | 4.55E-04 | 2.71E-07 | 5.67E-05 | 2.20E-07 | 8.82E-05 | 9.47E-02 | 2.50E-10 |
| Duchaine Boulevard & Samuel Barnet Boulevard | 1.61E-05 | 3.76E-04 | 4.05E-04 | 1.27E-04 | 7.58E-08 | 1.59E-05 | 6.14E-08 | 2.46E-05 | 2.65E-02 | 6.98E-11 |
| Phillips Road & Samuel Barnet Boulevard | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

AERMOD Emissions (g/s)

| | Styrene | Toluene | Xylene | Chloride | Mercury (total) | Arsenic Compounds | Chromium 6+ | Nickel Compounds | Primary Exhaust PM2.5 - Total | Dioxins |
|---|---|---|---|---|---|---|---|---|---|---|
| Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road | 1.89E-07 | 4.40E-06 | 4.73E-06 | 1.49E-06 | 8.87E-10 | 1.86E-07 | 7.19E-10 | 2.88E-07 | 3.10E-04 | 8.17E-13 |
| Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road | 1.62E-07 | 3.77E-06 | 4.06E-06 | 1.28E-06 | 7.61E-10 | 1.59E-07 | 6.17E-10 | 2.47E-07 | 2.66E-04 | 7.01E-13 |
| Phillips Road & Theodore Rice Boulevard/Braley Road | 1.90E-07 | 4.44E-06 | 4.77E-06 | 1.50E-06 | 8.95E-10 | 1.87E-07 | 7.25E-10 | 2.91E-07 | 3.12E-04 | 8.24E-13 |
| Duchaine Boulevard & Theodore Rice Boulevard | 1.60E-08 | 3.74E-07 | 4.02E-07 | 1.26E-07 | 7.53E-11 | 1.58E-08 | 6.10E-11 | 2.45E-08 | 2.63E-05 | 6.94E-14 |
| Duchaine Boulevard & Samuel Barnet Boulevard | 4.48E-09 | 1.04E-07 | 1.12E-07 | 3.53E-08 | 2.11E-11 | 4.40E-09 | 1.71E-11 | 6.85E-09 | 7.35E-06 | 1.94E-14 |
| Phillips Road & Samuel Barnet Boulevard | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

# Parallel Products
# Mobile Source Emissions Analysis

## Truck Emissions At Idling Points at Facility

MOVES Emission Factors

| | Furans |
|---|---|
| 0 mph | 3.72E-09 |

ONSITE

Idling Times
- Truck Exhaust Inbound Scale
- Truck Exhaust Pause Area (Stop) 1
- Truck Exhaust Pause Area (Stop) 2
- Truck Exhaust Outbound Scale

(1) vehicle hours of delay (idle) per hour of actual time

Emissions (g/hr)

| | Furans |
|---|---|
| Truck Exhaust Inbound Scale | 2.97E-09 |
| Truck Exhaust Pause Area (Stop) 1 | 2.97E-09 |
| Truck Exhaust Pause Area (Stop) 2 | 2.97E-09 |
| Truck Exhaust Outbound Scale | 2.97E-09 |

AERMOD Emissions (g/s)

| | Furans |
|---|---|
| Truck Exhaust Inbound Scale | 8.26E-13 |
| Truck Exhaust Pause Area (Stop) 1 | 8.26E-13 |
| Truck Exhaust Pause Area (Stop) 2 | 8.26E-13 |
| Truck Exhaust Outbound Scale | 8.26E-13 |

OFFSITE

Idling Times
- Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road
- Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road
- Phillips Road & Theodore Rice Boulevard/Braley Road
- Duchaine Boulevard & Theodore Rice Boulevard
- Duchaine Boulevard & Samuel Barnet Boulevard
- Phillips Road & Samuel Barnet Boulevard

(1) uses factor of 33% to conservatively account for conversion of SYNCHR

(2) hours of delay (idle) for all vehicle per hour of actual time

Emissions (g/hr)

| | Furans |
|---|---|
| Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road | 1.79E-09 |
| Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road | 1.54E-09 |
| Phillips Road & Theodore Rice Boulevard/Braley Road | 1.81E-09 |
| Duchaine Boulevard & Theodore Rice Boulevard | 1.52E-10 |
| Duchaine Boulevard & Samuel Barnet Boulevard | 4.25E-11 |
| Phillips Road & Samuel Barnet Boulevard | 0.00E+00 |

AERMOD Emissions (g/s)

| | Furans |
|---|---|
| Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road | 4.98E-13 |
| Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road | 4.27E-13 |
| Phillips Road & Theodore Rice Boulevard/Braley Road | 5.02E-13 |
| Duchaine Boulevard & Theodore Rice Boulevard | 4.23E-14 |
| Duchaine Boulevard & Samuel Barnet Boulevard | 1.18E-14 |
| Phillips Road & Samuel Barnet Boulevard | 0.00E+00 |

# Parallel Products
# Mobile Source Emissions Analysis

Truck Emissions on Roadway Links

| Link ID | Link Description | link Avg Speed | Link Area m2 | Link Vehicle Miles Traveled VMT/hr (peak hr) | NOX MOVES Emission Factor g/VMT | NOX MOVES Total NOX g/hr (peak hr) | NOX Total Roadway NOX g/s (peak hr) | NOX Total Roadway NOX g/s/m2 (peak hr) | CO MOVES Emission Factor g/VMT | CO MOVES Total CO g/hr (peak hr) | CO Total Roadway CO g/s (peak hr) | CO Total Roadway CO g/s/m2 (peak hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Onsite - Entry to 1st Scale | 15 | 2086.0 | 4.1 | 8.976 | 36.625 | 1.02E-02 | 4.88E-06 | 2.382 | 9.720 | 2.70E-03 | 1.29E-06 |
| 2 | Onsite - 1st Scale to Tipping | 5 | 651.0 | 1.4 | 17.170 | 24.725 | 6.87E-03 | 1.06E-05 | 5.156 | 7.425 | 2.06E-03 | 3.17E-06 |
| 3 | Onsite - Tipping to 2nd Scale | 5 | 623.0 | 1.4 | 17.170 | 24.725 | 6.87E-03 | 1.10E-05 | 5.156 | 7.425 | 2.06E-03 | 3.31E-06 |
| 4 | Onsite - 2nd Scale to Exit | 15 | 8358.7 | 18.5 | 8.976 | 165.888 | 4.61E-02 | 5.51E-06 | 2.382 | 44.026 | 1.22E-02 | 1.46E-06 |
| 5 | Duchaine Blvd to Barnet (100% NB) | 25 | 2032.1 | 8.6 | 7.195 | 62.164 | 1.73E-02 | 8.50E-06 | 1.778 | 15.364 | 4.27E-03 | 2.10E-06 |
| 6 | Duchaine Blvd Barnet to Rice (100% NB) | 25 | 4537.4 | 19.2 | 7.195 | 138.141 | 3.84E-02 | 8.46E-06 | 1.778 | 34.142 | 9.48E-03 | 2.09E-06 |
| 7 | Rice Blvd to Rte 140 (100% NB) | 25 | 4441.5 | 18.7 | 7.195 | 134.688 | 3.74E-02 | 8.42E-06 | 1.778 | 33.288 | 9.25E-03 | 2.08E-06 |
| 8 | Rte 140 NB On-Ramp (100% NB) | 15 | 2541.7 | 10.6 | 8.976 | 94.793 | 2.63E-02 | 1.04E-05 | 2.382 | 25.158 | 6.99E-03 | 2.75E-06 |
| 9 | Rte 140 SB Off-Ramp (100% NB) | 15 | 1936.2 | 8.2 | 8.976 | 73.249 | 2.03E-02 | 1.05E-05 | 2.382 | 19.440 | 5.40E-03 | 2.79E-06 |

# Parallel Products
# Mobile Source Emissions Analysis

Truck Emissions on Roadway Links

| | | PM10 | | | | | PM2.5 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Fugitive: | 48.1 | g/VMT | | | Fugitive: | 12.0 | g/VMT | |
| | | MOVES Emission Factor | MOVES Total PM10 | Fugitive Roadway PM10 | Total Roadway PM10 | Total Roadway PM10 | MOVES Emission Factor | MOVES Total PM2.5 | Fugitive Roadway PM2.5 | Total Roadway PM2.5 | Total Roadway PM2.5 |
| Link ID | Link Description | g/VMT | g/hr (peak hr) | g/hr (peak hr) | g/s (peak hr) | g/s/m2 (peak hr) | g/VMT | g/hr (peak hr) | g/hr (peak hr) | g/s (peak hr) | g/s/m2 (peak hr) |
| 1 | Onsite - Entry to 1st Scale | 1.149 | 4.688 | 196.38 | 5.59E-02 | 2.68E-05 | 0.509 | 2.077 | 49.09 | 1.42E-02 | 6.81E-06 |
| 2 | Onsite - 1st Scale to Tipping | 2.938 | 4.231 | 69.31 | 2.04E-02 | 3.14E-05 | 1.043 | 1.502 | 17.33 | 5.23E-03 | 8.03E-06 |
| 3 | Onsite - Tipping to 2nd Scale | 2.938 | 4.231 | 69.31 | 2.04E-02 | 3.28E-05 | 1.043 | 1.502 | 17.33 | 5.23E-03 | 8.40E-06 |
| 4 | Onsite - 2nd Scale to Exit | 1.149 | 21.233 | 889.47 | 2.53E-01 | 3.03E-05 | 0.509 | 9.408 | 222.37 | 6.44E-02 | 7.70E-06 |
| 5 | Duchaine Blvd to Barnet (100% NB) | 0.757 | 6.545 | 0.000 | 1.82E-03 | 8.95E-07 | 0.393 | 3.398 | 0.000 | 9.44E-04 | 4.65E-07 |
| 6 | Duchaine Blvd Barnet to Rice (100% NB) | 0.757 | 14.544 | 0.000 | 4.04E-03 | 8.90E-07 | 0.393 | 7.552 | 0.000 | 2.10E-03 | 4.62E-07 |
| 7 | Rice Blvd to Rte 140 (100% NB) | 0.757 | 14.180 | 0.000 | 3.94E-03 | 8.87E-07 | 0.393 | 7.363 | 0.000 | 2.05E-03 | 4.61E-07 |
| 8 | Rte 140 NB On-Ramp (100% NB) | 1.149 | 12.133 | 0.000 | 3.37E-03 | 1.33E-06 | 0.509 | 5.376 | 0.000 | 1.49E-03 | 5.88E-07 |
| 9 | Rte 140 SB Off-Ramp (100% NB) | 1.149 | 9.376 | 0.000 | 2.60E-03 | 1.35E-06 | 0.509 | 4.154 | 0.000 | 1.15E-03 | 5.96E-07 |

# Parallel Products
# Mobile Source Emissions Analysis

Truck Emissions on Roadway Links

| Link ID | Link Description | SO2 MOVES Emission Factor g/VMT | SO2 MOVES Total SO2 g/hr (peak hr) | SO2 Total Roadway SO2 g/s (peak hr) | SO2 Total Roadway SO2 g/s/m2 (peak hr) | Benzene MOVES Emission Factor g/VMT | Benzene MOVES Total Benzene g/hr (peak hr) | Benzene Total Roadway Benzene g/s (peak hr) | Benzene Total Roadway Benzene g/s/m2 (peak hr) | Ethanol MOVES Emission Factor g/VMT | Ethanol MOVES Total Ethanol g/hr (peak hr) | Ethanol Total Roadway Ethanol g/s (peak hr) | Ethanol Total Roadway Ethanol g/s/m2 (peak hr) | Naphthalene MOVES Emission Factor g/VMT | Naphthalene Total Naphthalene g/hr (peak hr) | Naphthalene Roadway Naphthalene g/s (peak hr) | Naphthalene Roadway Naphthalene g/s/m2 (peak hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Onsite - Entry to 1st Scale | 0.021 | 0.088 | 2.43E-05 | 1.17E-08 | 4.41E-03 | 1.80E-02 | 4.99E-06 | 2.39E-09 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.03E-03 | 2.05E-02 | 5.70E-06 | 2.73E-09 |
| 2 | Onsite - 1st Scale to Tipping | 0.036 | 0.053 | 1.46E-05 | 2.24E-08 | 1.19E-02 | 1.72E-02 | 4.77E-06 | 7.33E-09 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.38E-02 | 1.99E-02 | 5.53E-06 | 8.49E-09 |
| 3 | Onsite - Tipping to 2nd Scale | 0.036 | 0.053 | 1.46E-05 | 2.34E-08 | 1.19E-02 | 1.72E-02 | 4.77E-06 | 7.66E-09 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.38E-02 | 1.99E-02 | 5.53E-06 | 8.87E-09 |
| 4 | Onsite - 2nd Scale to Exit | 0.021 | 0.397 | 1.10E-04 | 1.32E-08 | 4.41E-03 | 8.14E-02 | 2.26E-05 | 2.71E-09 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.03E-03 | 9.30E-02 | 2.58E-05 | 3.09E-09 |
| 5 | Duchaine Blvd to Barnet (100% NB) | 0.018 | 0.153 | 4.26E-05 | 2.10E-08 | 2.87E-03 | 2.48E-02 | 6.88E-06 | 3.38E-09 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.24E-03 | 2.80E-02 | 7.77E-06 | 3.82E-09 |
| 6 | Duchaine Blvd Barnet to Rice (100% NB) | 0.018 | 0.341 | 9.46E-05 | 2.09E-08 | 2.87E-03 | 5.50E-02 | 1.53E-05 | 3.37E-09 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.24E-03 | 6.21E-02 | 1.73E-05 | 3.80E-09 |
| 7 | Rice Blvd to Rte 140 (100% NB) | 0.018 | 0.332 | 9.22E-05 | 2.08E-08 | 2.87E-03 | 5.36E-02 | 1.49E-05 | 3.36E-09 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.24E-03 | 6.06E-02 | 1.68E-05 | 3.79E-09 |
| 8 | Rte 140 NB On-Ramp (100% NB) | 0.021 | 0.227 | 6.30E-05 | 2.48E-08 | 4.41E-03 | 4.65E-02 | 1.29E-05 | 5.09E-09 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.03E-03 | 5.31E-02 | 1.48E-05 | 5.81E-09 |
| 9 | Rte 140 SB Off-Ramp (100% NB) | 0.021 | 0.175 | 4.87E-05 | 2.51E-08 | 4.41E-03 | 3.60E-02 | 9.99E-06 | 5.16E-09 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.03E-03 | 4.11E-02 | 1.14E-05 | 5.89E-09 |

# Parallel Products
# Mobile Source Emissions Analysis

Truck Emissions on Roadway Links

| | | 1,3-Butadiene | | | | Formaldehyde | | | | Acetaldehyde | | | | Acrolein | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MOVES Emission Factor | MOVES Total 1,3-Butadiene | Roadway 1,3-Butadiene | Roadway 1,3-Butadiene | MOVES Emission Factor | Total Formaldehyde | Roadway Formaldehyde | Roadway Formaldehyde | MOVES Emission Factor | Total Acetaldehyde | Roadway Acetaldehyde | Roadway Acetaldehyde | MOVES Emission Factor | MOVES Total Acrolein | Total Roadway Acrolein | Total Roadway Acrolein |
| Link ID | Link Description | g/VMT | g/hr (peak hr) | g/s (peak hr) | g/s/m2 (peak hr) | g/VMT | g/hr (peak hr) | g/s (peak hr) | g/s/m2 (peak hr) | g/VMT | g/hr (peak hr) | g/s (peak hr) | g/s/m2 (peak hr) | g/VMT | g/hr (peak hr) | g/s (peak hr) | g/s/m2 (peak hr) |
| 1 | Onsite - Entry to 1st Scale | 1.22E-03 | 5.00E-03 | 1.39E-06 | 6.65E-10 | 5.03E-02 | 2.05E-01 | 5.70E-05 | 2.73E-08 | 2.02E-02 | 8.25E-02 | 2.29E-05 | 1.10E-08 | 3.51E-03 | 1.43E-02 | 3.98E-06 | 1.91E-09 |
| 2 | Onsite - 1st Scale to Tipping | 3.34E-03 | 4.81E-03 | 1.34E-06 | 2.05E-09 | 1.39E-01 | 2.00E-01 | 5.54E-05 | 8.51E-08 | 5.56E-02 | 8.01E-02 | 2.22E-05 | 3.42E-08 | 9.62E-03 | 1.39E-02 | 3.85E-06 | 5.91E-09 |
| 3 | Onsite - Tipping to 2nd Scale | 3.34E-03 | 4.81E-03 | 1.34E-06 | 2.14E-09 | 1.39E-01 | 2.00E-01 | 5.54E-05 | 8.90E-08 | 5.56E-02 | 8.01E-02 | 2.22E-05 | 3.57E-08 | 9.62E-03 | 1.39E-02 | 3.85E-06 | 6.18E-09 |
| 4 | Onsite - 2nd Scale to Exit | 1.22E-03 | 2.26E-02 | 6.29E-06 | 7.52E-10 | 5.03E-02 | 9.29E-01 | 2.58E-04 | 3.09E-08 | 2.02E-02 | 3.74E-01 | 1.04E-04 | 1.24E-08 | 3.51E-03 | 6.48E-02 | 1.80E-05 | 2.15E-09 |
| 5 | Duchaine Blvd to Barnet (100% NB) | 7.92E-04 | 6.85E-03 | 1.90E-06 | 9.36E-10 | 3.23E-02 | 2.79E-01 | 7.75E-05 | 3.81E-08 | 1.30E-02 | 1.12E-01 | 3.12E-05 | 1.54E-08 | 2.26E-03 | 1.95E-02 | 5.42E-06 | 2.67E-09 |
| 6 | Duchaine Blvd Barnet to Rice (100% NB) | 7.92E-04 | 1.52E-02 | 4.23E-06 | 9.31E-10 | 3.23E-02 | 6.20E-01 | 1.72E-04 | 3.79E-08 | 1.30E-02 | 2.50E-01 | 6.94E-05 | 1.53E-08 | 2.26E-03 | 4.34E-02 | 1.20E-05 | 2.66E-09 |
| 7 | Rice Blvd to Rte 140 (100% NB) | 7.92E-04 | 1.48E-02 | 4.12E-06 | 9.28E-10 | 3.23E-02 | 6.04E-01 | 1.68E-04 | 3.78E-08 | 1.30E-02 | 2.44E-01 | 6.77E-05 | 1.52E-08 | 2.26E-03 | 4.23E-02 | 1.17E-05 | 2.65E-09 |
| 8 | Rte 140 NB On-Ramp (100% NB) | 1.22E-03 | 1.29E-02 | 3.59E-06 | 1.41E-09 | 5.03E-02 | 5.31E-01 | 1.48E-04 | 5.80E-08 | 2.02E-02 | 2.14E-01 | 5.93E-05 | 2.34E-08 | 3.51E-03 | 3.71E-02 | 1.03E-05 | 4.05E-09 |
| 9 | Rte 140 SB Off-Ramp (100% NB) | 1.22E-03 | 9.99E-03 | 2.78E-06 | 1.43E-09 | 5.03E-02 | 4.10E-01 | 1.14E-04 | 5.89E-08 | 2.02E-02 | 1.65E-01 | 4.59E-05 | 2.37E-08 | 3.51E-03 | 2.86E-02 | 7.95E-06 | 4.11E-09 |

# Parallel Products
# Mobile Source Emissions Analysis

## Truck Emissions on Roadway Links

| | | **Ammonia (NH3)** | | | | **Ethyl Benzene** | | | | **Hexane** | | | | **Styrene** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MOVES Emission Factor | Total Ammonia (NH3) | Roadway Ammonia (NH3) | Roadway Ammonia (NH3) | MOVES Emission Factor | Total Ethyl Benzene | Roadway Ethyl Benzene | Roadway Ethyl Benzene | MOVES Emission Factor | MOVES Total Hexane | Total Roadway Hexane | Total Roadway Hexane | MOVES Emission Factor | MOVES Total Styrene | Total Roadway Styrene | Total Roadway Styrene |
| Link ID | Link Description | g/VMT | g/hr (peak hr) | g/s (peak hr) | g/s/m2 (peak hr) | g/VMT | g/hr (peak hr) | g/s (peak hr) | g/s/m2 (peak hr) | g/VMT | g/hr (peak hr) | g/s (peak hr) | g/s/m2 (peak hr) | g/VMT | g/hr (peak hr) | g/s (peak hr) | g/s/m2 (peak hr) |
| 1 | Onsite - Entry to 1st Scale | 3.15E-02 | 1.29E-01 | 3.57E-05 | 1.71E-08 | 1.74E-03 | 7.09E-03 | 1.97E-06 | 9.44E-10 | 1.68E-03 | 6.86E-03 | 1.90E-06 | 9.13E-10 | 3.97E-04 | 1.62E-03 | 4.50E-07 | 2.16E-10 |
| 2 | Onsite - 1st Scale to Tipping | 7.84E-02 | 1.13E-01 | 3.13E-05 | 4.82E-08 | 4.65E-03 | 6.69E-03 | 1.86E-06 | 2.86E-09 | 4.18E-03 | 6.03E-03 | 1.67E-06 | 2.57E-09 | 7.54E-04 | 1.09E-03 | 3.01E-07 | 4.63E-10 |
| 3 | Onsite - Tipping to 2nd Scale | 7.84E-02 | 1.13E-01 | 3.13E-05 | 5.03E-08 | 4.65E-03 | 6.69E-03 | 1.86E-06 | 2.98E-09 | 4.18E-03 | 6.03E-03 | 1.67E-06 | 2.69E-09 | 7.54E-04 | 1.09E-03 | 3.01E-07 | 4.84E-10 |
| 4 | Onsite - 2nd Scale to Exit | 3.15E-02 | 5.82E-01 | 1.62E-04 | 1.93E-08 | 1.74E-03 | 3.21E-02 | 8.92E-06 | 1.07E-09 | 1.68E-03 | 3.11E-02 | 8.63E-06 | 1.03E-09 | 3.97E-04 | 7.35E-03 | 2.04E-06 | 2.44E-10 |
| 5 | Duchaine Blvd to Barnet (100% NB) | 2.38E-02 | 2.06E-01 | 5.72E-05 | 2.81E-08 | 1.14E-03 | 9.85E-03 | 2.73E-06 | 1.35E-09 | 1.16E-03 | 9.99E-03 | 2.77E-06 | 1.37E-09 | 2.95E-04 | 2.55E-03 | 7.08E-07 | 3.48E-10 |
| 6 | Duchaine Blvd Barnet to Rice (100% NB) | 2.38E-02 | 4.57E-01 | 1.27E-04 | 2.80E-08 | 1.14E-03 | 2.19E-02 | 6.08E-06 | 1.34E-09 | 1.16E-03 | 2.22E-02 | 6.17E-06 | 1.36E-09 | 2.95E-04 | 5.66E-03 | 1.57E-06 | 3.47E-10 |
| 7 | Rice Blvd to Rte 140 (100% NB) | 2.38E-02 | 4.46E-01 | 1.24E-04 | 2.79E-08 | 1.14E-03 | 2.13E-02 | 5.93E-06 | 1.33E-09 | 1.16E-03 | 2.16E-02 | 6.01E-06 | 1.35E-09 | 2.95E-04 | 5.52E-03 | 1.53E-06 | 3.45E-10 |
| 8 | Rte 140 NB On-Ramp (100% NB) | 3.15E-02 | 3.33E-01 | 9.24E-05 | 3.63E-08 | 1.74E-03 | 1.83E-02 | 5.10E-06 | 2.01E-09 | 1.68E-03 | 1.77E-02 | 4.93E-06 | 1.94E-09 | 3.97E-04 | 4.20E-03 | 1.17E-06 | 4.59E-10 |
| 9 | Rte 140 SB Off-Ramp (100% NB) | 3.15E-02 | 2.57E-01 | 7.14E-05 | 3.69E-08 | 1.74E-03 | 1.42E-02 | 3.94E-06 | 2.03E-09 | 1.68E-03 | 1.37E-02 | 3.81E-06 | 1.97E-09 | 3.97E-04 | 3.24E-03 | 9.01E-07 | 4.65E-10 |

# Parallel Products
## Mobile Source Emissions Analysis

Truck Emissions on Roadway Links

| | | Toluene | | | | Xylene | | | | Chloride | | | | Mercury (total) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MOVES Emission Factor | MOVES Total Toluene | Total Roadway Toluene | Total Roadway Toluene | MOVES Emission Factor | MOVES Total Xylene | Total Roadway Xylene | Total Roadway Xylene | MOVES Emission Factor | MOVES Total Chloride | Total Roadway Chloride | Total Roadway Chloride | MOVES Emission Factor | Total Mercury (total) | Roadway Mercury (total) | Roadway Mercury (total) |
| Link ID | Link Description | g/VMT | g/hr (peak hr) | g/s (peak hr) | g/s/m2 (peak hr) | g/VMT | g/hr (peak hr) | g/s (peak hr) | g/s/m2 (peak hr) | g/VMT | g/hr (peak hr) | g/s (peak hr) | g/s/m2 (peak hr) | g/VMT | g/hr (peak hr) | g/s (peak hr) | g/s/m2 (peak hr) |
| 1 | Onsite - Entry to 1st Scale | 4.94E-03 | 2.02E-02 | 5.60E-06 | 2.68E-09 | 5.36E-03 | 2.19E-02 | 6.07E-06 | 2.91E-09 | 9.93E-04 | 4.05E-03 | 1.13E-06 | 5.40E-10 | 4.42E-07 | 1.80E-06 | 5.01E-10 | 2.40E-13 |
| 2 | Onsite - 1st Scale to Tipping | 1.31E-02 | 1.89E-02 | 5.24E-06 | 8.05E-09 | 1.44E-02 | 2.07E-02 | 5.76E-06 | 8.84E-09 | 3.19E-03 | 4.59E-03 | 1.27E-06 | 1.96E-09 | 1.33E-06 | 1.91E-06 | 5.30E-10 | 8.14E-13 |
| 3 | Onsite - Tipping to 2nd Scale | 1.31E-02 | 1.89E-02 | 5.24E-06 | 8.42E-09 | 1.44E-02 | 2.07E-02 | 5.76E-06 | 9.24E-09 | 3.19E-03 | 4.59E-03 | 1.27E-06 | 2.05E-09 | 1.33E-06 | 1.91E-06 | 5.30E-10 | 8.51E-13 |
| 4 | Onsite - 2nd Scale to Exit | 4.94E-03 | 9.13E-02 | 2.54E-05 | 3.03E-09 | 5.36E-03 | 9.90E-02 | 2.75E-05 | 3.29E-09 | 9.93E-04 | 1.84E-02 | 5.10E-06 | 6.10E-10 | 4.42E-07 | 8.17E-06 | 2.27E-09 | 2.71E-13 |
| 5 | Duchaine Blvd to Barnet (100% NB) | 3.26E-03 | 2.81E-02 | 7.82E-06 | 3.85E-09 | 3.51E-03 | 3.03E-02 | 8.41E-06 | 4.14E-09 | 6.28E-04 | 5.42E-03 | 1.51E-06 | 7.41E-10 | 2.65E-07 | 2.29E-06 | 6.36E-10 | 3.13E-13 |
| 6 | Duchaine Blvd Barnet to Rice (100% NB) | 3.26E-03 | 6.25E-02 | 1.74E-05 | 3.83E-09 | 3.51E-03 | 6.73E-02 | 1.87E-05 | 4.12E-09 | 6.28E-04 | 1.21E-02 | 3.35E-06 | 7.38E-10 | 2.65E-07 | 5.09E-06 | 1.41E-09 | 3.12E-13 |
| 7 | Rice Blvd to Rte 140 (100% NB) | 3.26E-03 | 6.10E-02 | 1.69E-05 | 3.81E-09 | 3.51E-03 | 6.56E-02 | 1.82E-05 | 4.10E-09 | 6.28E-04 | 1.17E-02 | 3.26E-06 | 7.35E-10 | 2.65E-07 | 4.96E-06 | 1.38E-09 | 3.10E-13 |
| 8 | Rte 140 NB On-Ramp (100% NB) | 4.94E-03 | 5.22E-02 | 1.45E-05 | 5.70E-09 | 5.36E-03 | 5.66E-02 | 1.57E-05 | 6.19E-09 | 9.93E-04 | 1.05E-02 | 2.91E-06 | 1.15E-09 | 4.42E-07 | 4.67E-06 | 1.30E-09 | 5.10E-13 |
| 9 | Rte 140 SB Off-Ramp (100% NB) | 4.94E-03 | 4.03E-02 | 1.12E-05 | 5.78E-09 | 5.36E-03 | 4.37E-02 | 1.21E-05 | 6.27E-09 | 9.93E-04 | 8.11E-03 | 2.25E-06 | 1.16E-09 | 4.42E-07 | 3.61E-06 | 1.00E-09 | 5.17E-13 |

# Parallel Products
# Mobile Source Emissions Analysis

Truck Emissions on Roadway Links

| | | Arsenic Compounds | | | | Chromium 6+ | | | | Nickel Compounds | | | | Primary Exhaust PM2.5 - Total | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MOVES Emission Factor | Total Arsenic Compoun | Roadway Arsenic Compoun | Roadway Arsenic Compoun | MOVES Emission Factor | Total Chromiu m 6+ | Roadway Chromiu m 6+ | Roadway Chromiu m 6+ | MOVES Emission Factor | Total Nickel Compoun | Roadway Nickel Compoun | Roadway Nickel Compoun | MOVES Emission Factor | Total Primary Exhaust | Roadway Primary Exhaust | Roadway Primary Exhaust |
| Link ID | Link Description | g/VMT | g/hr (peak hr) | g/s (peak hr) | g/s/m2 (peak hr) | g/VMT | g/hr (peak hr) | g/s (peak hr) | g/s/m2 (peak hr) | g/VMT | g/hr (peak hr) | g/s (peak hr) | g/s/m2 (peak hr) | g/VMT | g/hr (peak hr) | g/s (peak hr) | g/s/m2 (peak hr) |
| 1 | Onsite - Entry to 1st Scale | 9.24E-05 | 3.77E-04 | 1.05E-07 | 5.02E-11 | 3.58E-07 | 1.46E-06 | 4.06E-10 | 1.94E-13 | 1.44E-04 | 5.86E-04 | 1.63E-07 | 7.80E-11 | 4.21E-01 | 1.72E+00 | 4.78E-04 | 2.29E-07 |
| 2 | Onsite - 1st Scale to Tipping | 2.77E-04 | 3.99E-04 | 1.11E-07 | 1.70E-10 | 1.07E-06 | 1.55E-06 | 4.30E-10 | 6.60E-13 | 4.31E-04 | 6.21E-04 | 1.72E-07 | 2.65E-10 | 7.80E-01 | 1.12E+00 | 3.12E-04 | 4.79E-07 |
| 3 | Onsite - Tipping to 2nd Scale | 2.77E-04 | 3.99E-04 | 1.11E-07 | 1.78E-10 | 1.07E-06 | 1.55E-06 | 4.30E-10 | 6.90E-13 | 4.31E-04 | 6.21E-04 | 1.72E-07 | 2.77E-10 | 7.80E-01 | 1.12E+00 | 3.12E-04 | 5.01E-07 |
| 4 | Onsite - 2nd Scale to Exit | 9.24E-05 | 1.71E-03 | 4.74E-07 | 5.67E-11 | 3.58E-07 | 6.62E-06 | 1.84E-09 | 2.20E-13 | 1.44E-04 | 2.65E-03 | 7.37E-07 | 8.82E-11 | 4.21E-01 | 7.79E+00 | 2.16E-03 | 2.59E-07 |
| 5 | Duchaine Blvd to Barnet (100% NB) | 5.54E-05 | 4.79E-04 | 1.33E-07 | 6.55E-11 | 2.15E-07 | 1.86E-06 | 5.16E-10 | 2.54E-13 | 8.62E-05 | 7.45E-04 | 2.07E-07 | 1.02E-10 | 3.44E-01 | 2.98E+00 | 8.26E-04 | 4.07E-07 |
| 6 | Duchaine Blvd Barnet to Rice (100% NB) | 5.54E-05 | 1.06E-03 | 2.96E-07 | 6.52E-11 | 2.15E-07 | 4.12E-06 | 1.15E-09 | 2.52E-13 | 8.62E-05 | 1.65E-03 | 4.60E-07 | 1.01E-10 | 3.44E-01 | 6.61E+00 | 1.84E-03 | 4.05E-07 |
| 7 | Rice Blvd to Rte 140 (100% NB) | 5.54E-05 | 1.04E-03 | 2.88E-07 | 6.49E-11 | 2.15E-07 | 4.02E-06 | 1.12E-09 | 2.51E-13 | 8.62E-05 | 1.61E-03 | 4.48E-07 | 1.01E-10 | 3.44E-01 | 6.45E+00 | 1.79E-03 | 4.03E-07 |
| 8 | Rte 140 NB On-Ramp (100% NB) | 9.24E-05 | 9.76E-04 | 2.71E-07 | 1.07E-10 | 3.58E-07 | 3.78E-06 | 1.05E-09 | 4.13E-13 | 1.44E-04 | 1.52E-03 | 4.21E-07 | 1.66E-10 | 4.21E-01 | 4.45E+00 | 1.24E-03 | 4.86E-07 |
| 9 | Rte 140 SB Off-Ramp (100% NB) | 9.24E-05 | 7.54E-04 | 2.09E-07 | 1.08E-10 | 3.58E-07 | 2.92E-06 | 8.11E-10 | 4.19E-13 | 1.44E-04 | 1.17E-03 | 3.26E-07 | 1.68E-10 | 4.21E-01 | 3.44E+00 | 9.55E-04 | 4.93E-07 |

# Parallel Products
## Mobile Source Emissions Analysis

Truck Emissions on Roadway Links

| | | Dioxins | | | | Furans | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MOVES Emission Factor | MOVES Total Dioxins | Total Roadway Dioxins | Total Roadway Dioxins | MOVES Emission Factor | MOVES Total Furans | Total Roadway Furans | Total Roadway Furans |
| Link ID | Link Description | g/VMT | g/hr (peak hr) | g/s (peak hr) | g/s/m2 (peak hr) | g/VMT | g/hr (peak hr) | g/s (peak hr) | g/s/m2 (peak hr) |
| 1 | Onsite - Entry to 1st Scale | 4.07E-10 | 1.66E-09 | 4.61E-13 | 2.21E-16 | 2.48E-10 | 1.01E-09 | 2.81E-13 | 1.35E-16 |
| 2 | Onsite - 1st Scale to Tipping | 1.22E-09 | 1.76E-09 | 4.88E-13 | 7.50E-16 | 7.44E-10 | 1.07E-09 | 2.97E-13 | 4.57E-16 |
| 3 | Onsite - Tipping to 2nd Scale | 1.22E-09 | 1.76E-09 | 4.88E-13 | 7.84E-16 | 7.44E-10 | 1.07E-09 | 2.97E-13 | 4.77E-16 |
| 4 | Onsite - 2nd Scale to Exit | 4.07E-10 | 7.52E-09 | 2.09E-12 | 2.50E-16 | 2.48E-10 | 4.58E-09 | 1.27E-12 | 1.52E-16 |
| 5 | Duchaine Blvd to Barnet (100% NB) | 2.44E-10 | 2.11E-09 | 5.86E-13 | 2.88E-16 | 1.49E-10 | 1.28E-09 | 3.57E-13 | 1.76E-16 |
| 6 | Duchaine Blvd Barnet to Rice (100% NB) | 2.44E-10 | 4.69E-09 | 1.30E-12 | 2.87E-16 | 1.49E-10 | 2.86E-09 | 7.93E-13 | 1.75E-16 |
| 7 | Rice Blvd to Rte 140 (100% NB) | 2.44E-10 | 4.57E-09 | 1.27E-12 | 2.86E-16 | 1.49E-10 | 2.78E-09 | 7.73E-13 | 1.74E-16 |
| 8 | Rte 140 NB On-Ramp (100% NB) | 4.07E-10 | 4.30E-09 | 1.19E-12 | 4.70E-16 | 2.48E-10 | 2.62E-09 | 7.27E-13 | 2.86E-16 |
| 9 | Rte 140 SB Off-Ramp (100% NB) | 4.07E-10 | 3.32E-09 | 9.22E-13 | 4.76E-16 | 2.48E-10 | 2.02E-09 | 5.62E-13 | 2.90E-16 |

| POINT SOURCES | # | ID | Type | Location known? | EMISFACT Restrictions | Release Height (ft) | Release Height (m) | Vs (ft/s) | Vs (m/s) | Ds (ft) | Ds (m) | Ts (F) | NOX (g/s) | CO (g/s) | PM10 (g/s) | PM2.5 (g/s) | SO2 (g/s) | ODOR (OU/S) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Biosolids Ionization Stacks (APR-NOV) | 1 | BIOION1 | Point | Y | Apr-Nov | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | Amb+10°F | 0 | 0 | 0 | 0 | 0 | 572.3 |
| Biosolids Ionization Stacks (APR-NOV) | 1 | BIOION2 | Point | Y | Apr-Nov | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | Amb+10°F | 0 | 0 | 0 | 0 | 0 | 572.3 |
| Biosolids Scrubber Stack (APR-NOV) | 1 | BIOCS | Point | Y | Apr-Nov | 40 | 12.19 | 76 | 23.16 | 2.3333 | 0.71 | Amb+10°F | 0 | 0 | 0 | 0 | 0 | 909.6 |
| Biosolids Ionization Stacks (DEC-MAR) | 1 | BIOION1W | Point | Y | Dec-Mar | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | 50 | 0 | 0 | 0 | 0 | 0 | 572.3 |
| Biosolids Ionization Stacks (DEC-MAR) | 1 | BIOION2W | Point | Y | Dec-Mar | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | 50 | 0 | 0 | 0 | 0 | 0 | 572.3 |
| Biosolids Scrubber Stack (DEC-MAR) | 1 | BIOCSW | Point | Y | Dec-Mar | 40 | 12.19 | 76 | 23.16 | 2.3333 | 0.71 | 50 | 0 | 0 | 0 | 0 | 0 | 909.6 |
| Biosolids Dryers MERGED STACK | 1 | BIODRYM | Point | Y | | 40 | 12.19 | 56.57 | 17.24 | 1.3340 | 0.41 | 140 | 0.3928 | 0.2075 | 0.0188 | 0.0188 | 0.0015 | 0 |
| Biosolids Boiler Stack | 1 | BIOBOIL | Point | Y | Dec-Mar | 40 | 12.19 | 60.4 | 18.41 | 0.5 | 0.15 | 140 | 0.0371 | 0.0311 | 0.0028 | 0.0028 | 0.0002 | 0 |
| Glass Processing Boiler Stack | 1 | GLASBOIL | Point | Y | Dec-Mar | 40 | 12.19 | 60.4 | 18.41 | 0.5 | 0.15 | 140 | 0.0371 | 0.0311 | 0.0028 | 0.0028 | 0.0002 | 0 |
| Transfer Building Vents MERGED STACK (1hr) | 1 | TVENTM1 | Point | Y | | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 0.00841 | 0.10122 | 0.00855 | 0.00157 | 0.00011 | 2038.8 |
| Transfer Building Vents MERGED STACK (24hr) | 1 | TVENTM24 | Point | Y | | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 0.00701 | 0.08435 | 0.00848 | 0.00150 | 0.00009 | 2038.8 |
| Transfer Building Vents MERGED STACK (ANNUAL) | 1 | TVENTMA | Point | Y | | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 0.00701 | 0.08435 | 0.00848 | 0.00150 | 0.00009 | 2038.8 |
| Processing Building Vents MERGED STACK | 1 | PVENTM | Point | Y | | 70 | 21.34 | 27 | 8.23 | 7.523 | 2.29 | Amb+10°F | 0 | 0 | 0.00903 | 0.00127 | 0 | 1699.0 |
| Cooling Tower Cells | 1 | BIOCT1 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 2.04E-03 | 2.45E-04 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT2 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 2.04E-03 | 2.45E-04 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT3 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 2.04E-03 | 2.45E-04 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT4 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 2.04E-03 | 2.45E-04 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | |
| **VOLUME SOURCES** | **#** | | | **Location known?** | **EMISFACT Restrictions** | **Release Height (ft)** | **Release Height (m)** | **Init Sig-Y (m)** | | **Init Sig-Z (m)** | | | **NOX (g/s)** | **CO (g/s)** | **PM10 (g/s)** | **PM2.5 (g/s)** | **SO2 (g/s)** | **ODOR (OU/S)** |
| Transfer Building Door (1hr) | 1 | DOORS1 | Volume | Y | | 14 | 4.27 | 4.68 | | 5.67 | | | 9.35E-04 | 1.12E-02 | 9.49E-04 | 1.74E-04 | 1.26E-05 | 226.5 |
| Transfer Building Door (24hr) | 1 | DOORS24 | Volume | Y | | 14 | 4.27 | 4.68 | | 5.67 | | | 7.79E-04 | 9.37E-03 | 9.42E-04 | 1.66E-04 | 1.05E-05 | 226.5 |
| Transfer Building Door (ANNUAL) | 1 | DOORSA | Volume | Y | | 14 | 4.27 | 4.68 | | 5.67 | | | 7.79E-04 | 9.37E-03 | 9.42E-04 | 1.66E-04 | 1.05E-05 | 226.5 |
| Glass Processing North Bunker Area (1hr) | 1 | GLASSN1 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 5.43E-03 | 6.53E-02 | 1.57E-03 | 6.61E-04 | 7.32E-05 | 0 |
| Glass Processing South Area (1hr) | 1 | GLASSS1 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 5.43E-03 | 6.53E-02 | 1.56E-02 | 4.87E-03 | 7.32E-05 | 0 |
| Glass Processing North Bunker Area (24hr) | 1 | GLASSN24 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 6.78E-04 | 8.16E-03 | 1.33E-03 | 4.24E-04 | 9.15E-06 | 0 |
| Glass Processing South Area (24hr) | 1 | GLASSS24 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 6.78E-04 | 8.16E-03 | 1.54E-02 | 4.63E-03 | 9.15E-06 | 0 |
| Glass Processing North Bunker Area (ANNUAL) | 1 | GLASSNA | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 6.78E-04 | 8.16E-03 | 3.23E-04 | 1.21E-04 | 9.15E-06 | 0 |
| Glass Processing South Area (ANNUAL) | 1 | GLASSSA | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 6.78E-04 | 8.16E-03 | 1.43E-02 | 4.33E-03 | 9.15E-06 | 0 |
| Truck Exhaust Inbound Scale | 1 | INSCALE | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 8.33E-03 | 2.41E-03 | 5.59E-04 | 5.14E-04 | 1.43E-05 | 0 |
| Truck Exhaust Pause Area (Stop) 1 | 1 | STOP1 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 8.33E-03 | 2.41E-03 | 5.59E-04 | 5.14E-04 | 1.43E-05 | 0 |
| Truck Exhaust Pause Area (Stop) 2 | 1 | STOP2 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 8.33E-03 | 2.41E-03 | 5.59E-04 | 5.14E-04 | 1.43E-05 | 0 |
| Truck Exhaust Outbound Scale | 1 | OUTSCALE | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 8.33E-03 | 2.41E-03 | 5.59E-04 | 5.14E-04 | 1.43E-05 | 0 |
| Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road | 1 | INT1 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 5.02E-03 | 1.45E-03 | 3.37E-04 | 3.10E-04 | 8.64E-06 | 0 |
| Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road | 1 | INT2 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 4.30E-03 | 1.25E-03 | 2.89E-04 | 2.66E-04 | 7.41E-06 | 0 |
| Phillips Road & Theodore Rice Boulevard/Braley Road | 1 | INT3 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 5.06E-03 | 1.47E-03 | 3.39E-04 | 3.12E-04 | 8.71E-06 | 0 |
| Duchaine Boulevard & Theodore Rice Boulevard | 1 | INT4 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 4.26E-04 | 1.23E-04 | 2.86E-05 | 2.63E-05 | 7.33E-07 | 0 |
| Duchaine Boulevard & Samuel Barnet Boulevard | 1 | INT5 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 1.19E-04 | 3.45E-05 | 7.99E-06 | 7.35E-06 | 2.05E-07 | 0 |
| | | | | | | | | | | | | | | | | | | |
| **AREA SOURCES** | **#** | | | **Location known?** | **EMISFACT Restrictions** | **Release Height (ft)** | | **Init Sig-Z (m)** | | **Area (ft2)** | | | **NOX (g/s)** | **CO (g/s)** | **PM10 (g/s)** | **PM2.5 (g/s)** | **SO2 (g/s)** | **ODOR (OU/S)** |
| None | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| **LINE (AREA) SOURCES (roadway segments)** | **#** | | | **Location known?** | **EMISFACT Restrictions** | **Release Height (ft)** | **Release Height (m)** | **Init Sig-Z (m)** | | | | | **NOX (g/s/m2)** | **CO (g/s/m2)** | **PM10 (g/s/m2)** | **PM2.5 (g/s/m2)** | **SO2 (g/s/m2)** | **ODOR (OU/S/m2)** |
| Onsite - Entry to 1st Scale | 1 | ROAD1 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 4.88E-06 | 1.29E-06 | 2.68E-05 | 6.81E-06 | 1.17E-08 | 0 |
| Onsite - 1st Scale to Tipping | 1 | ROAD2 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 1.06E-05 | 3.17E-06 | 3.14E-05 | 8.03E-06 | 2.24E-08 | 0 |
| Onsite - Tipping to 2nd Scale | 1 | ROAD3 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 1.10E-05 | 3.31E-06 | 3.28E-05 | 8.40E-06 | 2.34E-08 | 0 |
| Onsite - 2nd Scale to Exit | 1 | ROAD4 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 5.51E-06 | 1.46E-06 | 3.03E-05 | 7.70E-06 | 1.32E-08 | 0 |
| Duchaine Blvd to Barnet (100% NB) | 1 | ROAD5 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 8.50E-06 | 2.10E-06 | 8.95E-07 | 4.65E-07 | 2.10E-08 | 0 |
| Duchaine Blvd Barnet to Rice (100% NB) | 1 | ROAD6 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 8.46E-06 | 2.09E-06 | 8.90E-07 | 4.62E-07 | 2.09E-08 | 0 |
| Rice Blvd to Rte 140 (100% NB) | 1 | ROAD7 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 8.42E-06 | 2.08E-06 | 8.87E-07 | 4.61E-07 | 2.08E-08 | 0 |
| Rte 140 NB On-Ramp (100% NB) | 1 | ROAD8 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 1.04E-05 | 2.75E-06 | 1.33E-06 | 5.88E-07 | 2.48E-08 | 0 |
| Rte 140 SB Off-Ramp (100% NB) | 1 | ROAD9 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 1.05E-05 | 2.79E-06 | 1.35E-06 | 5.96E-07 | 2.51E-08 | 0 |

| POINT SOURCES | # | ID | Type | Location known? | EMISFACT Restrictions | Release Height (ft) | Release Height (m) | Vs (ft/s) | Vs (m/s) | Ds (ft) | Ds (m) | Ts (F) | 2-Methylnaphthalene | Benzene | Dichlorobenzene | Formaldehyde | Naphthalene | Toluene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Biosolids Ionization Stacks (APR-NOV) | 1 | BIOION1 | Point | Y | Apr-Nov | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | Amb+10°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Biosolids Ionization Stacks (APR-NOV) | 1 | BIOION2 | Point | Y | Apr-Nov | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | Amb+10°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Biosolids Scrubber Stack (APR-NOV) | 1 | BIOCS | Point | Y | Apr-Nov | 40 | 12.19 | 76 | 23.16 | 2.3333 | 0.71 | Amb+10°F | 0 | 1.76E-04 | 0 | 0 | 0 | 2.56E-04 |
| Biosolids Ionization Stacks (DEC-MAR) | 1 | BIOION1W | Point | Y | Dec-Mar | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | 50 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biosolids Ionization Stacks (DEC-MAR) | 1 | BIOION2W | Point | Y | Dec-Mar | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | 50 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biosolids Scrubber Stack (DEC-MAR) | 1 | BIOCSW | Point | Y | Dec-Mar | 40 | 12.19 | 76 | 23.16 | 2.3333 | 0.71 | 50 | 0 | 1.76E-04 | 0 | 0 | 0 | 2.56E-04 |
| Biosolids Dryers MERGED STACK | 1 | BIODRYM | Point | Y | | 40 | 12.19 | 56.57 | 17.24 | 1.3340 | 0.41 | 140 | 5.93E-08 | 5.19E-06 | 2.96E-06 | 1.85E-04 | 1.51E-06 | 8.40E-06 |
| Biosolids Boiler Stack | 1 | BIOBOIL | Point | Y | Dec-Mar | 40 | 12.19 | 60.4 | 18.41 | 0.5 | 0.15 | 140 | 8.89E-09 | 7.78E-07 | 4.45E-07 | 2.78E-05 | 2.26E-07 | 1.26E-06 |
| Glass Processing Boiler Stack | 1 | GLASBOIL | Point | Y | Dec-Mar | 40 | 12.19 | 60.4 | 18.41 | 0.5 | 0.15 | 140 | 8.89E-09 | 7.78E-07 | 4.45E-07 | 2.78E-05 | 2.26E-07 | 1.26E-06 |
| Transfer Building Vents MERGED STACK (1hr) | 1 | TVENTM1 | Point | Y | | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 0 | 1.33E-04 | 0 | 2.18E-03 | 1.52E-05 | 2.69E-04 |
| Transfer Building Vents MERGED STACK (24hr) | 1 | TVENTM24 | Point | Y | | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 0 | 1.10E-04 | 0 | 6.13E-05 | 1.27E-05 | 2.24E-04 |
| Transfer Building Vents MERGED STACK (ANNUAL) | 1 | TVENTMA | Point | Y | | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 0 | 1.10E-04 | 0 | 6.13E-05 | 1.27E-05 | 2.24E-04 |
| Processing Building Vents MERGED STACK | 1 | PVENTM | Point | Y | | 70 | 21.34 | 27 | 8.23 | 7.523 | 2.29 | Amb+10°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT1 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT2 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT3 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT4 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 | 0 | 0 |

| VOLUME SOURCES | # | | | Location known? | EMISFACT Restrictions | Release Height (ft) | Release Height (m) | Init Sig-Y (m) | | Init Sig-Z (m) | | | 2-Methylnaphthalene | Benzene | Dichlorobenzene | Formaldehyde | Naphthalene | Toluene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Transfer Building Door (1hr) | 1 | DOORS1 | Volume | Y | | 14 | 4.27 | 4.68 | | 5.67 | | | 0 | 1.47E-05 | 0 | 2.42E-04 | 1.69E-06 | 2.99E-05 |
| Transfer Building Door (24hr) | 1 | DOORS24 | Volume | Y | | 14 | 4.27 | 4.68 | | 5.67 | | | 0 | 1.23E-05 | 0 | 6.81E-06 | 1.41E-06 | 2.49E-05 |
| Transfer Building Door (ANNUAL) | 1 | DOORSA | Volume | Y | | 14 | 4.27 | 4.68 | | 5.67 | | | 0 | 1.23E-05 | 0 | 6.81E-06 | 1.41E-06 | 2.49E-05 |
| Glass Processing North Bunker Area (1hr) | 1 | GLASSN1 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 0 | 8.55E-05 | 0 | 1.41E-03 | 9.82E-06 | 1.74E-04 |
| Glass Processing South Area (1hr) | 1 | GLASSS1 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 0 | 8.55E-05 | 0 | 1.41E-03 | 9.82E-06 | 1.74E-04 |
| Glass Processing North Bunker Area (24hr) | 1 | GLASSN24 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 0 | 5.22E-05 | 0 | 5.93E-06 | 1.23E-06 | 4.15E-05 |
| Glass Processing South Area (24hr) | 1 | GLASSS24 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 0 | 5.22E-05 | 0 | 5.93E-06 | 1.23E-06 | 4.15E-05 |
| Glass Processing North Bunker Area (ANNUAL) | 1 | GLASSNA | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 0 | 5.22E-05 | 0 | 5.93E-06 | 1.23E-06 | 4.15E-05 |
| Glass Processing South Area (ANNUAL) | 1 | GLASSSA | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 0 | 5.22E-05 | 0 | 5.93E-06 | 1.23E-06 | 4.15E-05 |
| Truck Exhaust Inbound Scale | 1 | INSCALE | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 4.71E-07 | 0 | 8.46E-05 | 8.67E-06 | 7.31E-06 |
| Truck Exhaust Pause Area (Stop) 1 | 1 | STOP1 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 4.71E-07 | 0 | 8.46E-05 | 8.67E-06 | 7.31E-06 |
| Truck Exhaust Pause Area (Stop) 2 | 1 | STOP2 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 4.71E-07 | 0 | 8.46E-05 | 8.67E-06 | 7.31E-06 |
| Truck Exhaust Outbound Scale | 1 | OUTSCALE | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 4.71E-07 | 0 | 8.46E-05 | 8.67E-06 | 7.31E-06 |
| Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road | 1 | INT1 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 2.84E-07 | 0 | 5.10E-05 | 5.23E-06 | 4.40E-06 |
| Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road | 1 | INT2 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 2.43E-07 | 0 | 4.37E-05 | 4.48E-06 | 3.77E-06 |
| Phillips Road & Theodore Rice Boulevard/Braley Road | 1 | INT3 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 2.86E-07 | 0 | 5.14E-05 | 5.27E-06 | 4.44E-06 |
| Duchaine Boulevard & Theodore Rice Boulevard | 1 | INT4 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 2.41E-08 | 0 | 4.33E-06 | 4.44E-07 | 3.74E-07 |
| Duchaine Boulevard & Samuel Barnet Boulevard | 1 | INT5 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 6.73E-09 | 0 | 1.21E-06 | 1.24E-07 | 1.04E-07 |

| AREA SOURCES | # | | | Location known? | EMISFACT Restrictions | Release Height (ft) | | Init Sig-Z (m) | | Area (ft2) | | | 2-Methylnaphthalene | Benzene | Dichlorobenzene | Formaldehyde | Naphthalene | Toluene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| None | | | | | | | | | | | | | | | | | | |

| LINE (AREA) SOURCES (roadway segments) | # | | | Location known? | EMISFACT Restrictions | Release Height (ft) | Release Height (m) | Init Sig-Z (m) | | | | | 2-Methylnaphthalene | Benzene | Dichlorobenzene | Formaldehyde | Naphthalene | Toluene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite - Entry to 1st Scale | 1 | ROAD1 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 2.39E-09 | 0 | 2.73E-08 | 2.73E-09 | 2.68E-09 |
| Onsite - 1st Scale to Tipping | 1 | ROAD2 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 7.33E-09 | 0 | 8.51E-08 | 8.49E-09 | 8.05E-09 |
| Onsite - Tipping to 2nd Scale | 1 | ROAD3 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 7.66E-09 | 0 | 8.90E-08 | 8.87E-09 | 8.42E-09 |
| Onsite - 2nd Scale to Exit | 1 | ROAD4 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 2.71E-09 | 0 | 3.09E-08 | 3.09E-09 | 3.03E-09 |
| Duchaine Blvd to Barnet (100% NB) | 1 | ROAD5 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 3.38E-09 | 0 | 3.81E-08 | 3.82E-09 | 3.85E-09 |
| Duchaine Blvd Barnet to Rice (100% NB) | 1 | ROAD6 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 3.37E-09 | 0 | 3.79E-08 | 3.80E-09 | 3.83E-09 |
| Rice Blvd to Rte 140 (100% NB) | 1 | ROAD7 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 3.36E-09 | 0 | 3.78E-08 | 3.79E-09 | 3.81E-09 |
| Rte 140 NB On-Ramp (100% NB) | 1 | ROAD8 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 5.09E-09 | 0 | 5.80E-08 | 5.81E-09 | 5.70E-09 |
| Rte 140 SB Off-Ramp (100% NB) | 1 | ROAD9 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 5.16E-09 | 0 | 5.89E-08 | 5.89E-09 | 5.78E-09 |

| POINT SOURCES | # | ID | Type | Location known? | EMISFACT Restrictions | Release Height (ft) | Release Height (m) | Vs (ft/s) | Vs (m/s) | Ds (ft) | Ds (m) | Ts (F) | Arsenic | Beryllium | Cadmium | Chromium | Copper | Lead |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Biosolids Ionization Stacks (APR-NOV) | 1 | BIOION1 | Point | Y | Apr-Nov | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | Amb+10°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Biosolids Ionization Stacks (APR-NOV) | 1 | BIOION2 | Point | Y | Apr-Nov | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | Amb+10°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Biosolids Scrubber Stack (APR-NOV) | 1 | BIOCS | Point | Y | Apr-Nov | 40 | 12.19 | 76 | 23.16 | 2.3333 | 0.71 | Amb+10°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Biosolids Ionization Stacks (DEC-MAR) | 1 | BIOION1W | Point | Y | Dec-Mar | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | 50 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biosolids Ionization Stacks (DEC-MAR) | 1 | BIOION2W | Point | Y | Dec-Mar | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | 50 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biosolids Scrubber Stack (DEC-MAR) | 1 | BIOCSW | Point | Y | Dec-Mar | 40 | 12.19 | 76 | 23.16 | 2.3333 | 0.71 | 50 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biosolids Dryers MERGED STACK | 1 | BIODRYM | Point | Y | | 40 | 12.19 | 56.57 | 17.24 | 1.3340 | 0.41 | 140 | 4.94E-07 | 2.96E-08 | 2.72E-06 | 3.46E-06 | 2.10E-06 | 1.24E-06 |
| Biosolids Boiler Stack | 1 | BIOBOIL | Point | Y | Dec-Mar | 40 | 12.19 | 60.4 | 18.41 | 0.5 | 0.15 | 140 | 7.41E-08 | 4.45E-09 | 4.08E-07 | 5.19E-07 | 3.15E-07 | 1.85E-07 |
| Glass Processing Boiler Stack | 1 | GLASBOIL | Point | Y | Dec-Mar | 40 | 12.19 | 60.4 | 18.41 | 0.5 | 0.15 | 140 | 7.41E-08 | 4.45E-09 | 4.08E-07 | 5.19E-07 | 3.15E-07 | 1.85E-07 |
| Transfer Building Vents MERGED STACK (1hr) | 1 | TVENTM1 | Point | Y | | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 2.93E-08 | 0 | 0 | 5.24E-10 | 0 | 0 |
| Transfer Building Vents MERGED STACK (24hr) | 1 | TVENTM24 | Point | Y | | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 2.44E-08 | 0 | 0 | 4.37E-10 | 0 | 0 |
| Transfer Building Vents MERGED STACK (ANNUAL) | 1 | TVENTMA | Point | Y | | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 2.44E-08 | 0 | 0 | 4.37E-10 | 0 | 0 |
| Processing Building Vents MERGED STACK | 1 | PVENTM | Point | Y | | 70 | 21.34 | 27 | 8.23 | 7.523 | 2.29 | Amb+10°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT1 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT2 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT3 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT4 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | |
| VOLUME SOURCES | # | | | Location known? | EMISFACT Restrictions | Release Height (ft) | Release Height (m) | Init Sig-Y (m) | | Init Sig-Z (m) | | | Arsenic | Beryllium | Cadmium | Chromium | Copper | Lead |
| Transfer Building Door (1hr) | 1 | DOORS1 | Volume | Y | | 14 | 4.27 | 4.68 | | 5.67 | | | 3.25E-09 | 0 | 0 | 5.83E-11 | 0 | 0 |
| Transfer Building Door (24hr) | 1 | DOORS24 | Volume | Y | | 14 | 4.27 | 4.68 | | 5.67 | | | 2.71E-09 | 0 | 0 | 4.85E-11 | 0 | 0 |
| Transfer Building Door (ANNUAL) | 1 | DOORSA | Volume | Y | | 14 | 4.27 | 4.68 | | 5.67 | | | 2.71E-09 | 0 | 0 | 4.85E-11 | 0 | 0 |
| Glass Processing North Bunker Area (1hr) | 1 | GLASSN1 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 1.89E-08 | 0 | 0.00E+00 | 3.38E-10 | 0 | 0 |
| Glass Processing South Area (1hr) | 1 | GLASSS1 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 1.89E-08 | 0 | 0.00E+00 | 3.38E-10 | 0 | 0 |
| Glass Processing North Bunker Area (24hr) | 1 | GLASSN24 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 2.36E-09 | 0 | 0.00E+00 | 4.23E-11 | 0 | 0 |
| Glass Processing South Area (24hr) | 1 | GLASSS24 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 2.36E-09 | 0 | 0.00E+00 | 4.23E-11 | 0 | 0 |
| Glass Processing North Bunker Area (ANNUAL) | 1 | GLASSNA | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 2.36E-09 | 0 | 0.00E+00 | 4.23E-11 | 0 | 0 |
| Glass Processing South Area (ANNUAL) | 1 | GLASSSA | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 2.36E-09 | 0 | 0.00E+00 | 4.23E-11 | 0 | 0 |
| Truck Exhaust Inbound Scale | 1 | INSCALE | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 3.08E-07 | 0 | 0 | 1.19E-09 | 0 | 0 |
| Truck Exhaust Pause Area (Stop) 1 | 1 | STOP1 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 3.08E-07 | 0 | 0 | 1.19E-09 | 0 | 0 |
| Truck Exhaust Pause Area (Stop) 2 | 1 | STOP2 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 3.08E-07 | 0 | 0 | 1.19E-09 | 0 | 0 |
| Truck Exhaust Outbound Scale | 1 | OUTSCALE | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 3.08E-07 | 0 | 0 | 1.19E-09 | 0 | 0 |
| Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road | 1 | INT1 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 1.86E-07 | 0 | 0 | 7.19E-10 | 0 | 0 |
| Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road | 1 | INT2 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 1.59E-07 | 0 | 0 | 6.17E-10 | 0 | 0 |
| Phillips Road & Theodore Rice Boulevard/Braley Road | 1 | INT3 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 1.87E-07 | 0 | 0 | 7.25E-10 | 0 | 0 |
| Duchaine Boulevard & Theodore Rice Boulevard | 1 | INT4 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 1.58E-08 | 0 | 0 | 6.10E-11 | 0 | 0 |
| Duchaine Boulevard & Samuel Barnet Boulevard | 1 | INT5 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 4.40E-09 | 0 | 0 | 1.71E-11 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | |
| AREA SOURCES | # | | | Location known? | EMISFACT Restrictions | Release Height (ft) | | Init Sig-Z (m) | | Area (ft2) | | | Arsenic | Beryllium | Cadmium | Chromium | Copper | Lead |
| None | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| LINE (AREA) SOURCES (roadway segments) | # | | | Location known? | EMISFACT Restrictions | Release Height (ft) | Release Height (m) | Init Sig-Z (m) | | | | | Arsenic | Beryllium | Cadmium | Chromium | Copper | Lead |
| Onsite - Entry to 1st Scale | 1 | ROAD1 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 5.02E-11 | 0 | 0 | 1.94E-13 | 0 | 0 |
| Onsite - 1st Scale to Tipping | 1 | ROAD2 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 1.70E-10 | 0 | 0 | 6.60E-13 | 0 | 0 |
| Onsite - Tipping to 2nd Scale | 1 | ROAD3 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 1.78E-10 | 0 | 0 | 6.90E-13 | 0 | 0 |
| Onsite - 2nd Scale to Exit | 1 | ROAD4 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 5.67E-11 | 0 | 0 | 2.20E-13 | 0 | 0 |
| Duchaine Blvd to Barnet (100% NB) | 1 | ROAD5 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 6.55E-11 | 0 | 0 | 2.54E-13 | 0 | 0 |
| Duchaine Blvd Barnet to Rice (100% NB) | 1 | ROAD6 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 6.52E-11 | 0 | 0 | 2.52E-13 | 0 | 0 |
| Rice Blvd to Rte 140 (100% NB) | 1 | ROAD7 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 6.49E-11 | 0 | 0 | 2.51E-13 | 0 | 0 |
| Rte 140 NB On-Ramp (100% NB) | 1 | ROAD8 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 1.07E-10 | 0 | 0 | 4.13E-13 | 0 | 0 |
| Rte 140 SB Off-Ramp (100% NB) | 1 | ROAD9 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 1.08E-10 | 0 | 0 | 4.19E-13 | 0 | 0 |

| POINT SOURCES | # | ID | Type | Location known? | EMISFACT Restrictions | Release Height (ft) | Release Height (m) | Vs (ft/s) | Vs (m/s) | Ds (ft) | Ds (m) | Ts (F) | Mercury | Nickel | Selenium | Vanadium | Ethanol | 1,3-Butadiene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Biosolids Ionization Stacks (APR-NOV) | 1 | BIOION1 | Point | Y | Apr-Nov | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | Amb+10°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Biosolids Ionization Stacks (APR-NOV) | 1 | BIOION2 | Point | Y | Apr-Nov | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | Amb+10°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Biosolids Scrubber Stack (APR-NOV) | 1 | BIOCS | Point | Y | Apr-Nov | 40 | 12.19 | 76 | 23.16 | 2.3333 | 0.71 | Amb+10°F | 0 | 0 | 0 | 0 | 4.04E-05 | 0 |
| Biosolids Ionization Stacks (DEC-MAR) | 1 | BIOION1W | Point | Y | Dec-Mar | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | 50 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biosolids Ionization Stacks (DEC-MAR) | 1 | BIOION2W | Point | Y | Dec-Mar | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | 50 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biosolids Scrubber Stack (DEC-MAR) | 1 | BIOCSW | Point | Y | Dec-Mar | 40 | 12.19 | 76 | 23.16 | 2.3333 | 0.71 | 50 | 0 | 0 | 0 | 0 | 4.04E-05 | 0 |
| Biosolids Dryers MERGED STACK | 1 | BIODRYM | Point | Y | | 40 | 12.19 | 56.57 | 17.24 | 1.3340 | 0.41 | 140 | 6.42E-07 | 5.19E-06 | 5.93E-08 | 5.68E-06 | 0 | 0 |
| Biosolids Boiler Stack | 1 | BIOBOIL | Point | Y | Dec-Mar | 40 | 12.19 | 60.4 | 18.41 | 0.5 | 0.15 | 140 | 9.64E-08 | 7.78E-07 | 8.89E-09 | 8.52E-07 | 0 | 0 |
| Glass Processing Boiler Stack | 1 | GLASBOIL | Point | Y | Dec-Mar | 40 | 12.19 | 60.4 | 18.41 | 0.5 | 0.15 | 140 | 9.64E-08 | 7.78E-07 | 8.89E-09 | 8.52E-07 | 0 | 0 |
| Transfer Building Vents MERGED STACK (1hr) | 1 | TVENTM1 | Point | Y | | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 3.89E-10 | 0 | 0 | 0 | 0 | 9.53E-06 |
| Transfer Building Vents MERGED STACK (24hr) | 1 | TVENTM24 | Point | Y | | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 3.24E-10 | 0 | 0 | 0 | 0 | 7.94E-06 |
| Transfer Building Vents MERGED STACK (ANNUAL) | 1 | TVENTMA | Point | Y | | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 3.24E-10 | 0 | 0 | 0 | 0 | 7.94E-06 |
| Processing Building Vents MERGED STACK | 1 | PVENTM | Point | Y | | 70 | 21.34 | 27 | 8.23 | 7.523 | 2.29 | Amb+10°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT1 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT2 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT3 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT4 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | |
| **VOLUME SOURCES** | **#** | | | **Location known?** | **EMISFACT Restrictions** | **Release Height (ft)** | **Release Height (m)** | **Init Sig-Y (m)** | | **Init Sig-Z (m)** | | | **Mercury** | **Nickel** | **Selenium** | **Vanadium** | **Ethanol** | **1,3-Butadiene** |
| Transfer Building Door (1hr) | 1 | DOORS1 | Volume | Y | | 14 | 4.27 | 4.68 | | 5.67 | | | 4.32E-11 | 0 | 0 | 0 | 0 | 1.06E-06 |
| Transfer Building Door (24hr) | 1 | DOORS24 | Volume | Y | | 14 | 4.27 | 4.68 | | 5.67 | | | 3.60E-11 | 0 | 0 | 0 | 0 | 8.82E-07 |
| Transfer Building Door (ANNUAL) | 1 | DOORSA | Volume | Y | | 14 | 4.27 | 4.68 | | 5.67 | | | 3.60E-11 | 0 | 0 | 0 | 0 | 8.82E-07 |
| Glass Processing North Bunker Area (1hr) | 1 | GLASSN1 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 2.51E-10 | 0 | 0 | 0 | 0 | 6.15E-06 |
| Glass Processing South Area (1hr) | 1 | GLASSS1 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 2.51E-10 | 0 | 0 | 0 | 0 | 6.15E-06 |
| Glass Processing North Bunker Area (24hr) | 1 | GLASSN24 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 3.14E-11 | 0 | 0 | 0 | 0 | 7.68E-07 |
| Glass Processing South Area (24hr) | 1 | GLASSS24 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 3.14E-11 | 0 | 0 | 0 | 0 | 7.68E-07 |
| Glass Processing North Bunker Area (ANNUAL) | 1 | GLASSNA | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 3.14E-11 | 0 | 0 | 0 | 0 | 7.68E-07 |
| Glass Processing South Area (ANNUAL) | 1 | GLASSSA | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 3.14E-11 | 0 | 0 | 0 | 0 | 7.68E-07 |
| Truck Exhaust Inbound Scale | 1 | INSCALE | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 1.47E-09 | 4.79E-07 | 0 | 0 | 0 | 2.24E-06 |
| Truck Exhaust Pause Area (Stop) 1 | 1 | STOP1 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 1.47E-09 | 4.79E-07 | 0 | 0 | 0 | 2.24E-06 |
| Truck Exhaust Pause Area (Stop) 2 | 1 | STOP2 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 1.47E-09 | 4.79E-07 | 0 | 0 | 0 | 2.24E-06 |
| Truck Exhaust Outbound Scale | 1 | OUTSCALE | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 1.47E-09 | 4.79E-07 | 0 | 0 | 0 | 2.24E-06 |
| Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road | 1 | INT1 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 8.87E-10 | 2.88E-07 | 0 | 0 | 0 | 1.35E-06 |
| Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road | 1 | INT2 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 7.61E-10 | 2.47E-07 | 0 | 0 | 0 | 1.16E-06 |
| Phillips Road & Theodore Rice Boulevard/Braley Road | 1 | INT3 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 8.95E-10 | 2.91E-07 | 0 | 0 | 0 | 1.36E-06 |
| Duchaine Boulevard & Theodore Rice Boulevard | 1 | INT4 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 7.53E-11 | 2.45E-08 | 0 | 0 | 0 | 1.14E-07 |
| Duchaine Boulevard & Samuel Barnet Boulevard | 1 | INT5 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 2.11E-11 | 6.85E-09 | 0 | 0 | 0 | 3.20E-08 |
| | | | | | | | | | | | | | | | | | | |
| **AREA SOURCES** | **#** | | | **Location known?** | **EMISFACT Restrictions** | **Release Height (ft)** | | **Init Sig-Z (m)** | | **Area (ft2)** | | | **Mercury** | **Nickel** | **Selenium** | **Vanadium** | **Ethanol** | **1,3-Butadiene** |
| None | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| **LINE (AREA) SOURCES (roadway segments)** | **#** | | | **Location known?** | **EMISFACT Restrictions** | **Release Height (ft)** | **Release Height (m)** | **Init Sig-Z (m)** | | | | | **Mercury** | **Nickel** | **Selenium** | **Vanadium** | **Ethanol** | **1,3-Butadiene** |
| Onsite - Entry to 1st Scale | 1 | ROAD1 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 2.40E-13 | 7.80E-11 | 0 | 0 | 0 | 6.65E-10 |
| Onsite - 1st Scale to Tipping | 1 | ROAD2 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 8.14E-13 | 2.65E-10 | 0 | 0 | 0 | 2.05E-09 |
| Onsite - Tipping to 2nd Scale | 1 | ROAD3 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 8.51E-13 | 2.77E-10 | 0 | 0 | 0 | 2.14E-09 |
| Onsite - 2nd Scale to Exit | 1 | ROAD4 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 2.71E-13 | 8.82E-11 | 0 | 0 | 0 | 7.52E-10 |
| Duchaine Blvd to Barnet (100% NB) | 1 | ROAD5 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 3.13E-13 | 1.02E-10 | 0 | 0 | 0 | 9.36E-10 |
| Duchaine Blvd Barnet to Rice (100% NB) | 1 | ROAD6 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 3.12E-13 | 1.01E-10 | 0 | 0 | 0 | 9.31E-10 |
| Rice Blvd to Rte 140 (100% NB) | 1 | ROAD7 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 3.10E-13 | 1.01E-10 | 0 | 0 | 0 | 9.28E-10 |
| Rte 140 NB On-Ramp (100% NB) | 1 | ROAD8 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 5.10E-13 | 1.66E-10 | 0 | 0 | 0 | 1.41E-09 |
| Rte 140 SB Off-Ramp (100% NB) | 1 | ROAD9 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 5.17E-13 | 1.68E-10 | 0 | 0 | 0 | 1.43E-09 |

| POINT SOURCES | # | ID | Type | Location known? | EMISFACT Restrictions | Release Height (ft) | Release Height (m) | Vs (ft/s) | Vs (m/s) | Ds (ft) | Ds (m) | Ts (F) | Acetaldehyde | Acrolein | Ammonia (NH3) | Ethyl Benzene | Hexane | Styrene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Biosolids Ionization Stacks (APR-NOV) | 1 | BIOION1 | Point | Y | Apr-Nov | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | Amb+10°F | 0 | 0 | 2.43E-03 | 0 | 0 | 0 |
| Biosolids Ionization Stacks (APR-NOV) | 1 | BIOION2 | Point | Y | Apr-Nov | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | Amb+10°F | 0 | 0 | 2.43E-03 | 0 | 0 | 0 |
| Biosolids Scrubber Stack (APR-NOV) | 1 | BIOCS | Point | Y | Apr-Nov | 40 | 12.19 | 76 | 23.16 | 2.3333 | 0.71 | Amb+10°F | 0 | 0 | 2.93E-02 | 7.16E-06 | 1.43E-05 | 3.44E-05 |
| Biosolids Ionization Stacks (DEC-MAR) | 1 | BIOION1W | Point | Y | Dec-Mar | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | 50 | 0 | 0 | 2.43E-03 | 0 | 0 | 0 |
| Biosolids Ionization Stacks (DEC-MAR) | 1 | BIOION2W | Point | Y | Dec-Mar | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | 50 | 0 | 0 | 2.43E-03 | 0 | 0 | 0 |
| Biosolids Scrubber Stack (DEC-MAR) | 1 | BIOCSW | Point | Y | Dec-Mar | 40 | 12.19 | 76 | 23.16 | 2.3333 | 0.71 | 50 | 0 | 0 | 2.93E-02 | 7.16E-06 | 1.43E-05 | 3.44E-05 |
| Biosolids Dryers MERGED STACK | 1 | BIODRYM | Point | Y |  | 40 | 12.19 | 56.57 | 17.24 | 1.3340 | 0.41 | 140 | 0 | 0 | 0 | 0 | 4.45E-03 | 0 |
| Biosolids Boiler Stack | 1 | BIOBOIL | Point | Y | Dec-Mar | 40 | 12.19 | 60.4 | 18.41 | 0.5 | 0.15 | 140 | 0 | 0 | 0 | 0 | 6.67E-04 | 0 |
| Glass Processing Boiler Stack | 1 | GLASBOIL | Point | Y | Dec-Mar | 40 | 12.19 | 60.4 | 18.41 | 0.5 | 0.15 | 140 | 0 | 0 | 0 | 0 | 6.67E-04 | 0 |
| Transfer Building Vents MERGED STACK (1hr) | 1 | TVENTM1 | Point | Y |  | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 7.28E-04 | 1.09E-04 | 1.51E-04 | 6.83E-05 | 5.14E-05 | 0 |
| Transfer Building Vents MERGED STACK (24hr) | 1 | TVENTM24 | Point | Y |  | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 6.07E-04 | 9.07E-05 | 1.26E-04 | 5.69E-05 | 4.28E-05 | 0 |
| Transfer Building Vents MERGED STACK (ANNUAL) | 1 | TVENTMA | Point | Y |  | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 6.07E-04 | 9.07E-05 | 1.26E-04 | 5.69E-05 | 4.28E-05 | 0 |
| Processing Building Vents MERGED STACK | 1 | PVENTM | Point | Y |  | 70 | 21.34 | 27 | 8.23 | 7.523 | 2.29 | Amb+10°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT1 | Point | Y |  | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT2 | Point | Y |  | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT3 | Point | Y |  | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT4 | Point | Y |  | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 | 0 | 0 |

| VOLUME SOURCES | # |  |  | Location known? | EMISFACT Restrictions | Release Height (ft) | Release Height (m) | Init Sig-Y (m) |  | Init Sig-Z (m) |  |  | Acetaldehyde | Acrolein | Ammonia (NH3) | Ethyl Benzene | Hexane | Styrene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Transfer Building Door (1hr) | 1 | DOORS1 | Volume | Y |  | 14 | 4.27 | 4.68 |  | 5.67 |  |  | 8.09E-05 | 1.21E-05 | 1.68E-05 | 7.58E-06 | 5.71E-06 | 0 |
| Transfer Building Door (24hr) | 1 | DOORS24 | Volume | Y |  | 14 | 4.27 | 4.68 |  | 5.67 |  |  | 6.74E-05 | 1.01E-05 | 1.40E-05 | 6.32E-06 | 4.76E-06 | 0 |
| Transfer Building Door (ANNUAL) | 1 | DOORSA | Volume | Y |  | 14 | 4.27 | 4.68 |  | 5.67 |  |  | 6.74E-05 | 1.01E-05 | 1.40E-05 | 6.32E-06 | 4.76E-06 | 0 |
| Glass Processing North Bunker Area (1hr) | 1 | GLASSN1 | Volume | Y |  | 25.443 | 7.76 | 11.63 |  | 7.21 |  |  | 4.70E-04 | 7.02E-05 | 9.77E-05 | 4.40E-05 | 3.31E-05 | 0.00E+00 |
| Glass Processing South Area (1hr) | 1 | GLASSS1 | Volume | Y |  | 25.443 | 7.76 | 11.63 |  | 7.21 |  |  | 4.70E-04 | 7.02E-05 | 9.77E-05 | 4.40E-05 | 3.31E-05 | 0.00E+00 |
| Glass Processing North Bunker Area (24hr) | 1 | GLASSN24 | Volume | Y |  | 25.443 | 7.76 | 11.63 |  | 7.21 |  |  | 5.87E-05 | 3.37E-05 | 1.22E-05 | 5.50E-06 | 3.23E-06 | 0 |
| Glass Processing South Area (24hr) | 1 | GLASSS24 | Volume | Y |  | 25.443 | 7.76 | 11.63 |  | 7.21 |  |  | 5.87E-05 | 3.37E-05 | 1.22E-05 | 5.50E-06 | 3.23E-06 | 0 |
| Glass Processing North Bunker Area (ANNUAL) | 1 | GLASSNA | Volume | Y |  | 25.443 | 7.76 | 11.63 |  | 7.21 |  |  | 5.87E-05 | 3.37E-05 | 1.22E-05 | 5.50E-06 | 3.23E-06 | 0 |
| Glass Processing South Area (ANNUAL) | 1 | GLASSSA | Volume | Y |  | 25.443 | 7.76 | 11.63 |  | 7.21 |  |  | 5.87E-05 | 3.37E-05 | 1.22E-05 | 5.50E-06 | 3.23E-06 | 0 |
| Truck Exhaust Inbound Scale | 1 | INSCALE | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 |  | 3.37 |  |  | 3.47E-05 | 6.10E-06 | 8.37E-05 | 2.82E-06 | 2.40E-06 | 3.14E-07 |
| Truck Exhaust Pause Area (Stop) 1 | 1 | STOP1 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 |  | 3.37 |  |  | 3.47E-05 | 6.10E-06 | 8.37E-05 | 2.82E-06 | 2.40E-06 | 3.14E-07 |
| Truck Exhaust Pause Area (Stop) 2 | 1 | STOP2 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 |  | 3.37 |  |  | 3.47E-05 | 6.10E-06 | 8.37E-05 | 2.82E-06 | 2.40E-06 | 3.14E-07 |
| Truck Exhaust Outbound Scale | 1 | OUTSCALE | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 |  | 3.37 |  |  | 3.47E-05 | 6.10E-06 | 8.37E-05 | 2.82E-06 | 2.40E-06 | 3.14E-07 |
| Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road | 1 | INT1 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 |  | 3.37 |  |  | 2.09E-05 | 3.68E-06 | 5.04E-05 | 1.70E-06 | 1.45E-06 | 1.89E-07 |
| Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road | 1 | INT2 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 |  | 3.37 |  |  | 1.79E-05 | 3.15E-06 | 4.32E-05 | 1.46E-06 | 1.24E-06 | 1.62E-07 |
| Phillips Road & Theodore Rice Boulevard/Braley Road | 1 | INT3 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 |  | 3.37 |  |  | 2.11E-05 | 3.71E-06 | 5.08E-05 | 1.71E-06 | 1.46E-06 | 1.90E-07 |
| Duchaine Boulevard & Theodore Rice Boulevard | 1 | INT4 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 |  | 3.37 |  |  | 1.78E-06 | 3.12E-07 | 4.28E-06 | 1.44E-07 | 1.23E-07 | 1.60E-08 |
| Duchaine Boulevard & Samuel Barnet Boulevard | 1 | INT5 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 |  | 3.37 |  |  | 4.97E-07 | 8.73E-08 | 1.20E-06 | 4.03E-08 | 3.43E-08 | 4.48E-09 |

| AREA SOURCES | # |  |  | Location known? | EMISFACT Restrictions | Release Height (ft) |  | Init Sig-Z (m) |  | Area (ft2) |  |  | Acetaldehyde | Acrolein | Ammonia (NH3) | Ethyl Benzene | Hexane | Styrene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| None |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| LINE (AREA) SOURCES (roadway segments) | # |  |  | Location known? | EMISFACT Restrictions | Release Height (ft) | Release Height (m) | Init Sig-Z (m) |  |  |  |  | Acetaldehyde | Acrolein | Ammonia (NH3) | Ethyl Benzene | Hexane | Styrene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite - Entry to 1st Scale | 1 | ROAD1 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 |  |  |  |  | 1.10E-08 | 1.91E-09 | 1.71E-08 | 9.44E-10 | 9.13E-10 | 2.16E-10 |
| Onsite - 1st Scale to Tipping | 1 | ROAD2 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 |  |  |  |  | 3.42E-08 | 5.91E-09 | 4.82E-08 | 2.86E-09 | 2.57E-09 | 4.63E-10 |
| Onsite - Tipping to 2nd Scale | 1 | ROAD3 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 |  |  |  |  | 3.57E-08 | 6.18E-09 | 5.03E-08 | 2.98E-09 | 2.69E-09 | 4.84E-10 |
| Onsite - 2nd Scale to Exit | 1 | ROAD4 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 |  |  |  |  | 1.24E-08 | 2.15E-09 | 1.93E-08 | 1.07E-09 | 1.03E-09 | 2.44E-10 |
| Duchaine Blvd to Barnet (100% NB) | 1 | ROAD5 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 |  |  |  |  | 1.54E-08 | 2.67E-09 | 2.81E-08 | 1.35E-09 | 1.37E-09 | 3.48E-10 |
| Duchaine Blvd Barnet to Rice (100% NB) | 1 | ROAD6 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 |  |  |  |  | 1.53E-08 | 2.66E-09 | 2.80E-08 | 1.34E-09 | 1.36E-09 | 3.47E-10 |
| Rice Blvd to Rte 140 (100% NB) | 1 | ROAD7 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 |  |  |  |  | 1.52E-08 | 2.65E-09 | 2.79E-08 | 1.33E-09 | 1.35E-09 | 3.45E-10 |
| Rte 140 NB On-Ramp (100% NB) | 1 | ROAD8 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 |  |  |  |  | 2.34E-08 | 4.05E-09 | 3.63E-08 | 2.01E-09 | 1.94E-09 | 4.59E-10 |
| Rte 140 SB Off-Ramp (100% NB) | 1 | ROAD9 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 |  |  |  |  | 2.37E-08 | 4.11E-09 | 3.69E-08 | 2.03E-09 | 1.97E-09 | 4.65E-10 |

| POINT SOURCES | # | ID | Type | Location known? | EMISFACT Restrictions | Release Height (ft) | Release Height (m) | Vs (ft/s) | Vs (m/s) | Ds (ft) | Ds (m) | Ts (F) | Xylene | Chloride | Primary Exhaust PM2.5 - Total | Dioxins |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Biosolids Ionization Stacks (APR-NOV) | 1 | BIOION1 | Point | Y | Apr-Nov | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | Amb+10°F | 0 | 0 | 0 | 0 |
| Biosolids Ionization Stacks (APR-NOV) | 1 | BIOION2 | Point | Y | Apr-Nov | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | Amb+10°F | 0 | 0 | 0 | 0 |
| Biosolids Scrubber Stack (APR-NOV) | 1 | BIOCS | Point | Y | Apr-Nov | 40 | 12.19 | 76 | 23.16 | 2.3333 | 0.71 | Amb+10°F | 3.29E-04 | 0 | 0 | 0 |
| Biosolids Ionization Stacks (DEC-MAR) | 1 | BIOION1W | Point | Y | Dec-Mar | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | 50 | 0 | 0 | 0 | 0 |
| Biosolids Ionization Stacks (DEC-MAR) | 1 | BIOION2W | Point | Y | Dec-Mar | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | 50 | 0 | 0 | 0 | 0 |
| Biosolids Scrubber Stack (DEC-MAR) | 1 | BIOCSW | Point | Y | Dec-Mar | 40 | 12.19 | 76 | 23.16 | 2.3333 | 0.71 | 50 | 3.29E-04 | 0 | 0 | 0 |
| Biosolids Dryers MERGED STACK | 1 | BIODRYM | Point | Y | | 40 | 12.19 | 56.57 | 17.24 | 1.3340 | 0.41 | 140 | 0 | 0 | 0 | 0 |
| Biosolids Boiler Stack | 1 | BIOBOIL | Point | Y | Dec-Mar | 40 | 12.19 | 60.4 | 18.41 | 0.5 | 0.15 | 140 | 0 | 0 | 0 | 0 |
| Glass Processing Boiler Stack | 1 | GLASBOIL | Point | Y | Dec-Mar | 40 | 12.19 | 60.4 | 18.41 | 0.5 | 0.15 | 140 | 0 | 0 | 0 | 0 |
| Transfer Building Vents MERGED STACK (1hr) | 1 | TVENTM1 | Point | Y | | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 3.68E-04 | 0 | 4.21E-03 | 4.86E-13 |
| Transfer Building Vents MERGED STACK (24hr) | 1 | TVENTM24 | Point | Y | | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 3.06E-04 | 0 | 3.50E-04 | 4.05E-13 |
| Transfer Building Vents MERGED STACK (ANNUAL) | 1 | TVENTMA | Point | Y | | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 3.06E-04 | 0 | 3.50E-04 | 4.05E-13 |
| Processing Building Vents MERGED STACK | 1 | PVENTM | Point | Y | | 70 | 21.34 | 27 | 8.23 | 7.523 | 2.29 | Amb+10°F | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT1 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT2 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT3 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT4 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | |
| **VOLUME SOURCES** | **#** | | | **Location known?** | **EMISFACT Restrictions** | **Release Height (ft)** | **Release Height (m)** | **Init Sig-Y (m)** | | **Init Sig-Z (m)** | | | **Xylene** | **Chloride** | **Primary Exhaust PM2.5 - Total** | **Dioxins** |
| Transfer Building Door (1hr) | 1 | DOORS1 | Volume | Y | | 14 | 4.27 | 4.68 | | 5.67 | | | 4.09E-05 | 0 | 4.67E-04 | 5.40E-14 |
| Transfer Building Door (24hr) | 1 | DOORS24 | Volume | Y | | 14 | 4.27 | 4.68 | | 5.67 | | | 3.40E-05 | 0 | 3.89E-05 | 4.50E-14 |
| Transfer Building Door (ANNUAL) | 1 | DOORSA | Volume | Y | | 14 | 4.27 | 4.68 | | 5.67 | | | 3.40E-05 | 0 | 3.89E-05 | 4.50E-14 |
| Glass Processing North Bunker Area (1hr) | 1 | GLASSN1 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 2.37E-04 | 0.00E+00 | 3.98E-03 | 3.14E-13 |
| Glass Processing South Area (1hr) | 1 | GLASSS1 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 2.37E-04 | 0.00E+00 | 3.98E-03 | 3.14E-13 |
| Glass Processing North Bunker Area (24hr) | 1 | GLASSN24 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 2.98E-05 | 0 | 1.24E-03 | 3.92E-14 |
| Glass Processing South Area (24hr) | 1 | GLASSS24 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 2.98E-05 | 0 | 1.24E-03 | 3.92E-14 |
| Glass Processing North Bunker Area (ANNUAL) | 1 | GLASSNA | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 2.98E-05 | 0 | 1.24E-03 | 3.92E-14 |
| Glass Processing South Area (ANNUAL) | 1 | GLASSSA | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 2.98E-05 | 0 | 1.24E-03 | 3.92E-14 |
| Truck Exhaust Inbound Scale | 1 | INSCALE | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 7.86E-06 | 2.47E-06 | 5.14E-04 | 1.36E-12 |
| Truck Exhaust Pause Area (Stop) 1 | 1 | STOP1 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 7.86E-06 | 2.47E-06 | 5.14E-04 | 1.36E-12 |
| Truck Exhaust Pause Area (Stop) 2 | 1 | STOP2 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 7.86E-06 | 2.47E-06 | 5.14E-04 | 1.36E-12 |
| Truck Exhaust Outbound Scale | 1 | OUTSCALE | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 7.86E-06 | 2.47E-06 | 5.14E-04 | 1.36E-12 |
| Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road | 1 | INT1 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 4.73E-06 | 1.49E-06 | 3.10E-04 | 8.17E-13 |
| Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road | 1 | INT2 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 4.06E-06 | 1.28E-06 | 2.66E-04 | 7.01E-13 |
| Phillips Road & Theodore Rice Boulevard/Braley Road | 1 | INT3 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 4.77E-06 | 1.50E-06 | 3.12E-04 | 8.24E-13 |
| Duchaine Boulevard & Theodore Rice Boulevard | 1 | INT4 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 4.02E-07 | 1.26E-07 | 2.63E-05 | 6.94E-14 |
| Duchaine Boulevard & Samuel Barnet Boulevard | 1 | INT5 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 1.12E-07 | 3.53E-08 | 7.35E-06 | 1.94E-14 |
| | | | | | | | | | | | | | | | | |
| **AREA SOURCES** | **#** | | | **Location known?** | **EMISFACT Restrictions** | **Release Height (ft)** | | **Init Sig-Z (m)** | | **Area (ft2)** | | | **Xylene** | **Chloride** | **Primary Exhaust PM2.5 - Total** | **Dioxins** |
| None | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| **LINE (AREA) SOURCES (roadway segments)** | **#** | | | **Location known?** | **EMISFACT Restrictions** | **Release Height (ft)** | **Release Height (m)** | **Init Sig-Z (m)** | | | | | **Xylene** | **Chloride** | **Primary Exhaust PM2.5 - Total** | **Dioxins** |
| Onsite - Entry to 1st Scale | 1 | ROAD1 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 2.91E-09 | 5.40E-10 | 2.29E-07 | 2.21E-16 |
| Onsite - 1st Scale to Tipping | 1 | ROAD2 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 8.84E-09 | 1.96E-09 | 4.79E-07 | 7.50E-16 |
| Onsite - Tipping to 2nd Scale | 1 | ROAD3 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 9.24E-09 | 2.05E-09 | 5.01E-07 | 7.84E-16 |
| Onsite - 2nd Scale to Exit | 1 | ROAD4 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 3.29E-09 | 6.10E-10 | 2.59E-07 | 2.50E-16 |
| Duchaine Blvd to Barnet (100% NB) | 1 | ROAD5 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 4.14E-09 | 7.41E-10 | 4.07E-07 | 2.88E-16 |
| Duchaine Blvd Barnet to Rice (100% NB) | 1 | ROAD6 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 4.12E-09 | 7.38E-10 | 4.05E-07 | 2.87E-16 |
| Rice Blvd to Rte 140 (100% NB) | 1 | ROAD7 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 4.10E-09 | 7.35E-10 | 4.03E-07 | 2.86E-16 |
| Rte 140 NB On-Ramp (100% NB) | 1 | ROAD8 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 6.19E-09 | 1.15E-09 | 4.86E-07 | 4.70E-16 |
| Rte 140 SB Off-Ramp (100% NB) | 1 | ROAD9 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 6.27E-09 | 1.16E-09 | 4.93E-07 | 4.76E-16 |

| POINT SOURCES | # | ID | Type | Location known? | EMISFACT Restrictions | Release Height (ft) | Release Height (m) | Vs (ft/s) | Vs (m/s) | Ds (ft) | Ds (m) | Ts (F) | Furans | Hydrogen Sulfide | Carbonyl Sulfide | Carbon Disulfide | Acetone | Methyl Ethyl Ketone |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Biosolids Ionization Stacks (APR-NOV) | 1 | BIOION1 | Point | Y | Apr-Nov | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | Amb+10°F | 0 | 1.62E-03 | 2.85E-05 | 3.61E-05 | 0 | 0 |
| Biosolids Ionization Stacks (APR-NOV) | 1 | BIOION2 | Point | Y | Apr-Nov | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | Amb+10°F | 0 | 1.62E-03 | 2.85E-05 | 3.61E-05 | 0 | 0 |
| Biosolids Scrubber Stack (APR-NOV) | 1 | BIOCS | Point | Y | Apr-Nov | 40 | 12.19 | 76 | 23.16 | 2.3333 | 0.71 | Amb+10°F | 0 | 1.17E-03 | 4.24E-04 | 1.14E-03 | 1.46E-03 | 1.70E-04 |
| Biosolids Ionization Stacks (DEC-MAR) | 1 | BIOION1W | Point | Y | Dec-Mar | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | 50 | 0 | 1.62E-03 | 2.85E-05 | 3.61E-05 | 0 | 0 |
| Biosolids Ionization Stacks (DEC-MAR) | 1 | BIOION2W | Point | Y | Dec-Mar | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | 50 | 0 | 1.62E-03 | 2.85E-05 | 3.61E-05 | 0 | 0 |
| Biosolids Scrubber Stack (DEC-MAR) | 1 | BIOCSW | Point | Y | Dec-Mar | 40 | 12.19 | 76 | 23.16 | 2.3333 | 0.71 | 50 | 0 | 1.17E-03 | 4.24E-04 | 1.14E-03 | 1.46E-03 | 1.70E-04 |
| Biosolids Dryers MERGED STACK | 1 | BIODRYM | Point | Y | | 40 | 12.19 | 56.57 | 17.24 | 1.3340 | 0.41 | 140 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biosolids Boiler Stack | 1 | BIOBOIL | Point | Y | Dec-Mar | 40 | 12.19 | 60.4 | 18.41 | 0.5 | 0.15 | 140 | 0 | 0 | 0 | 0 | 0 | 0 |
| Glass Processing Boiler Stack | 1 | GLASBOIL | Point | Y | Dec-Mar | 40 | 12.19 | 60.4 | 18.41 | 0.5 | 0.15 | 140 | 0 | 0 | 0 | 0 | 0 | 0 |
| Transfer Building Vents MERGED STACK (1hr) | 1 | TVENTM1 | Point | Y | | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 3.28E-13 | 0 | 0 | 0 | 1.64E-04 | 3.45E-05 |
| Transfer Building Vents MERGED STACK (24hr) | 1 | TVENTM24 | Point | Y | | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 2.74E-13 | 0 | 0 | 0 | 1.37E-04 | 2.87E-05 |
| Transfer Building Vents MERGED STACK (ANNUAL) | 1 | TVENTMA | Point | Y | | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 2.74E-13 | 0 | 0 | 0 | 1.37E-04 | 2.87E-05 |
| Processing Building Vents MERGED STACK | 1 | PVENTM | Point | Y | | 70 | 21.34 | 27 | 8.23 | 7.523 | 2.29 | Amb+10°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT1 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT2 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT3 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT4 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 | 0 | 0 |

| VOLUME SOURCES | # | | | Location known? | EMISFACT Restrictions | Release Height (ft) | Release Height (m) | Init Sig-Y (m) | | Init Sig-Z (m) | | | Furans | Hydrogen Sulfide | Carbonyl Sulfide | Carbon Disulfide | Acetone | Methyl Ethyl Ketone |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Transfer Building Door (1hr) | 1 | DOORS1 | Volume | Y | | 14 | 4.27 | 4.68 | | 5.67 | | | 3.65E-14 | 0 | 0 | 0 | 1.82E-05 | 3.83E-06 |
| Transfer Building Door (24hr) | 1 | DOORS24 | Volume | Y | | 14 | 4.27 | 4.68 | | 5.67 | | | 3.04E-14 | 0 | 0 | 0 | 1.52E-05 | 3.19E-06 |
| Transfer Building Door (ANNUAL) | 1 | DOORSA | Volume | Y | | 14 | 4.27 | 4.68 | | 5.67 | | | 3.04E-14 | 0 | 0 | 0 | 1.52E-05 | 3.19E-06 |
| Glass Processing North Bunker Area (1hr) | 1 | GLASSN1 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 2.12E-13 | 0 | 0 | 0 | 1.06E-04 | 2.22E-05 |
| Glass Processing South Area (1hr) | 1 | GLASSS1 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 2.12E-13 | 0 | 0 | 0 | 1.06E-04 | 2.22E-05 |
| Glass Processing North Bunker Area (24hr) | 1 | GLASSN24 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 2.65E-14 | 0 | 0 | 0 | 1.32E-05 | 2.78E-06 |
| Glass Processing South Area (24hr) | 1 | GLASSS24 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 2.65E-14 | 0 | 0 | 0 | 1.32E-05 | 2.78E-06 |
| Glass Processing North Bunker Area (ANNUAL) | 1 | GLASSNA | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 2.65E-14 | 0 | 0 | 0 | 1.32E-05 | 2.78E-06 |
| Glass Processing South Area (ANNUAL) | 1 | GLASSSA | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 2.65E-14 | 0 | 0 | 0 | 1.32E-05 | 2.78E-06 |
| Truck Exhaust Inbound Scale | 1 | INSCALE | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 8.26E-13 | 0 | 0 | 0 | 0 | 0 |
| Truck Exhaust Pause Area (Stop) 1 | 1 | STOP1 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 8.26E-13 | 0 | 0 | 0 | 0 | 0 |
| Truck Exhaust Pause Area (Stop) 2 | 1 | STOP2 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 8.26E-13 | 0 | 0 | 0 | 0 | 0 |
| Truck Exhaust Outbound Scale | 1 | OUTSCALE | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 8.26E-13 | 0 | 0 | 0 | 0 | 0 |
| Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road | 1 | INT1 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 4.98E-13 | 0 | 0 | 0 | 0 | 0 |
| Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road | 1 | INT2 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 4.27E-13 | 0 | 0 | 0 | 0 | 0 |
| Phillips Road & Theodore Rice Boulevard/Braley Road | 1 | INT3 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 5.02E-13 | 0 | 0 | 0 | 0 | 0 |
| Duchaine Boulevard & Theodore Rice Boulevard | 1 | INT4 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 4.23E-14 | 0 | 0 | 0 | 0 | 0 |
| Duchaine Boulevard & Samuel Barnet Boulevard | 1 | INT5 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 1.18E-14 | 0 | 0 | 0 | 0 | 0 |

| AREA SOURCES | # | | | Location known? | EMISFACT Restrictions | Release Height (ft) | | Init Sig-Z (m) | | Area (ft2) | | | Furans | Hydrogen Sulfide | Carbonyl Sulfide | Carbon Disulfide | Acetone | Methyl Ethyl Ketone |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| None | | | | | | | | | | | | | | | | | | |

| LINE (AREA) SOURCES (roadway segments) | # | | | Location known? | EMISFACT Restrictions | Release Height (ft) | Release Height (m) | Init Sig-Z (m) | | | | | Furans | Hydrogen Sulfide | Carbonyl Sulfide | Carbon Disulfide | Acetone | Methyl Ethyl Ketone |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite - Entry to 1st Scale | 1 | ROAD1 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 1.35E-16 | 0 | 0 | 0 | 0 | 0 |
| Onsite - 1st Scale to Tipping | 1 | ROAD2 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 4.57E-16 | 0 | 0 | 0 | 0 | 0 |
| Onsite - Tipping to 2nd Scale | 1 | ROAD3 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 4.77E-16 | 0 | 0 | 0 | 0 | 0 |
| Onsite - 2nd Scale to Exit | 1 | ROAD4 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 1.52E-16 | 0 | 0 | 0 | 0 | 0 |
| Duchaine Blvd to Barnet (100% NB) | 1 | ROAD5 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 1.76E-16 | 0 | 0 | 0 | 0 | 0 |
| Duchaine Blvd Barnet to Rice (100% NB) | 1 | ROAD6 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 1.75E-16 | 0 | 0 | 0 | 0 | 0 |
| Rice Blvd to Rte 140 (100% NB) | 1 | ROAD7 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 1.74E-16 | 0 | 0 | 0 | 0 | 0 |
| Rte 140 NB On-Ramp (100% NB) | 1 | ROAD8 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 2.86E-16 | 0 | 0 | 0 | 0 | 0 |
| Rte 140 SB Off-Ramp (100% NB) | 1 | ROAD9 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 2.90E-16 | 0 | 0 | 0 | 0 | 0 |

| POINT SOURCES | # | ID | Type | Location known? | EMISFACT Restrictions | Release Height (ft) | Release Height (m) | Vs (ft/s) | Vs (m/s) | Ds (ft) | Ds (m) | Ts (F) | Propene | Chloromethane | Chloroethane | 2-propanol | Chloroform | Bromomethane |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Biosolids Ionization Stacks (APR-NOV) | 1 | BIOION1 | Point | Y | Apr-Nov | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | Amb+10°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Biosolids Ionization Stacks (APR-NOV) | 1 | BIOION2 | Point | Y | Apr-Nov | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | Amb+10°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Biosolids Scrubber Stack (APR-NOV) | 1 | BIOCS | Point | Y | Apr-Nov | 40 | 12.19 | 76 | 23.16 | 2.3333 | 0.71 | Amb+10°F | 1.50E-02 | 4.28E-03 | 2.75E-05 | 1.67E-05 | 3.21E-03 | 2.47E-03 |
| Biosolids Ionization Stacks (DEC-MAR) | 1 | BIOION1W | Point | Y | Dec-Mar | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | 50 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biosolids Ionization Stacks (DEC-MAR) | 1 | BIOION2W | Point | Y | Dec-Mar | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | 50 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biosolids Scrubber Stack (DEC-MAR) | 1 | BIOCSW | Point | Y | Dec-Mar | 40 | 12.19 | 76 | 23.16 | 2.3333 | 0.71 | 50 | 1.50E-02 | 4.28E-03 | 2.75E-05 | 1.67E-05 | 3.21E-03 | 2.47E-03 |
| Biosolids Dryers MERGED STACK | 1 | BIODRYM | Point | Y | | 40 | 12.19 | 56.57 | 17.24 | 1.3340 | 0.41 | 140 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biosolids Boiler Stack | 1 | BIOBOIL | Point | Y | Dec-Mar | 40 | 12.19 | 60.4 | 18.41 | 0.5 | 0.15 | 140 | 0 | 0 | 0 | 0 | 0 | 0 |
| Glass Processing Boiler Stack | 1 | GLASBOIL | Point | Y | Dec-Mar | 40 | 12.19 | 60.4 | 18.41 | 0.5 | 0.15 | 140 | 0 | 0 | 0 | 0 | 0 | 0 |
| Transfer Building Vents MERGED STACK (1hr) | 1 | TVENTM1 | Point | Y | | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Transfer Building Vents MERGED STACK (24hr) | 1 | TVENTM24 | Point | Y | | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Transfer Building Vents MERGED STACK (ANNUAL) | 1 | TVENTMA | Point | Y | | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Processing Building Vents MERGED STACK | 1 | PVENTM | Point | Y | | 70 | 21.34 | 27 | 8.23 | 7.523 | 2.29 | Amb+10°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT1 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT2 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT3 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT4 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 | 0 | 0 |

| VOLUME SOURCES | # | | | Location known? | EMISFACT Restrictions | Release Height (ft) | Release Height (m) | Init Sig-Y (m) | | Init Sig-Z (m) | | | Propene | Chloromethane | Chloroethane | 2-propanol | Chloroform | Bromomethane |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Transfer Building Door (1hr) | 1 | DOORS1 | Volume | Y | | 14 | 4.27 | 4.68 | | 5.67 | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Transfer Building Door (24hr) | 1 | DOORS24 | Volume | Y | | 14 | 4.27 | 4.68 | | 5.67 | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Transfer Building Door (ANNUAL) | 1 | DOORSA | Volume | Y | | 14 | 4.27 | 4.68 | | 5.67 | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Glass Processing North Bunker Area (1hr) | 1 | GLASSN1 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Glass Processing South Area (1hr) | 1 | GLASSS1 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Glass Processing North Bunker Area (24hr) | 1 | GLASSN24 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Glass Processing South Area (24hr) | 1 | GLASSS24 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Glass Processing North Bunker Area (ANNUAL) | 1 | GLASSNA | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Glass Processing South Area (ANNUAL) | 1 | GLASSSA | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Truck Exhaust Inbound Scale | 1 | INSCALE | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Truck Exhaust Pause Area (Stop) 1 | 1 | STOP1 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Truck Exhaust Pause Area (Stop) 2 | 1 | STOP2 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Truck Exhaust Outbound Scale | 1 | OUTSCALE | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road | 1 | INT1 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road | 1 | INT2 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Phillips Road & Theodore Rice Boulevard/Braley Road | 1 | INT3 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Duchaine Boulevard & Theodore Rice Boulevard | 1 | INT4 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Duchaine Boulevard & Samuel Barnet Boulevard | 1 | INT5 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 0 | 0 | 0 | 0 | 0 |

| AREA SOURCES | # | | | Location known? | EMISFACT Restrictions | Release Height (ft) | | Init Sig-Z (m) | | Area (ft2) | | | Propene | Chloromethane | Chloroethane | 2-propanol | Chloroform | Bromomethane |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| None | | | | | | | | | | | | | | | | | | |

| LINE (AREA) SOURCES (roadway segments) | # | | | Location known? | EMISFACT Restrictions | Release Height (ft) | Release Height (m) | Init Sig-Z (m) | | | | | Propene | Chloromethane | Chloroethane | 2-propanol | Chloroform | Bromomethane |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite - Entry to 1st Scale | 1 | ROAD1 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Onsite - 1st Scale to Tipping | 1 | ROAD2 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Onsite - Tipping to 2nd Scale | 1 | ROAD3 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Onsite - 2nd Scale to Exit | 1 | ROAD4 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Duchaine Blvd to Barnet (100% NB) | 1 | ROAD5 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Duchaine Blvd Barnet to Rice (100% NB) | 1 | ROAD6 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Rice Blvd to Rte 140 (100% NB) | 1 | ROAD7 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Rte 140 NB On-Ramp (100% NB) | 1 | ROAD8 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Rte 140 SB Off-Ramp (100% NB) | 1 | ROAD9 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 0 | 0 | 0 | 0 | 0 |

| POINT SOURCES | # | ID | Type | Location known? | EMISFACT Restrictions | Release Height (ft) | Release Height (m) | Vs (ft/s) | Vs (m/s) | Ds (ft) | Ds (m) | Ts (F) | Bromodichloromethane | Heptane | 1,2,4-Trimethylbenzene | Chlorobenzene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Biosolids Ionization Stacks (APR-NOV) | 1 | BIOION1 | Point | Y | Apr-Nov | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | Amb+10°F | 0 | 0 | 0 | 0 |
| Biosolids Ionization Stacks (APR-NOV) | 1 | BIOION2 | Point | Y | Apr-Nov | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | Amb+10°F | 0 | 0 | 0 | 0 |
| Biosolids Scrubber Stack (APR-NOV) | 1 | BIOCS | Point | Y | Apr-Nov | 40 | 12.19 | 76 | 23.16 | 2.3333 | 0.71 | Amb+10°F | 1.50E-04 | 9.57E-05 | 5.00E-06 | 2.37E-06 |
| Biosolids Ionization Stacks (DEC-MAR) | 1 | BIOION1W | Point | Y | Dec-Mar | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | 50 | 0 | 0 | 0 | 0 |
| Biosolids Ionization Stacks (DEC-MAR) | 1 | BIOION2W | Point | Y | Dec-Mar | 40 | 12.19 | 72.4 | 22.07 | 2.6667 | 0.81 | 50 | 0 | 0 | 0 | 0 |
| Biosolids Scrubber Stack (DEC-MAR) | 1 | BIOCSW | Point | Y | Dec-Mar | 40 | 12.19 | 76 | 23.16 | 2.3333 | 0.71 | 50 | 1.50E-04 | 9.57E-05 | 5.00E-06 | 2.37E-06 |
| Biosolids Dryers MERGED STACK | 1 | BIODRYM | Point | Y | | 40 | 12.19 | 56.57 | 17.24 | 1.3340 | 0.41 | 140 | 0 | 0 | 0 | 0 |
| Biosolids Boiler Stack | 1 | BIOBOIL | Point | Y | Dec-Mar | 40 | 12.19 | 60.4 | 18.41 | 0.5 | 0.15 | 140 | 0 | 0 | 0 | 0 |
| Glass Processing Boiler Stack | 1 | GLASBOIL | Point | Y | Dec-Mar | 40 | 12.19 | 60.4 | 18.41 | 0.5 | 0.15 | 140 | 0 | 0 | 0 | 0 |
| Transfer Building Vents MERGED STACK (1hr) | 1 | TVENTM1 | Point | Y | | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 0 | 0 | 0 | 0 |
| Transfer Building Vents MERGED STACK (24hr) | 1 | TVENTM24 | Point | Y | | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 0 | 0 | 0 | 0 |
| Transfer Building Vents MERGED STACK (ANNUAL) | 1 | TVENTMA | Point | Y | | 70 | 21.34 | 27 | 8.23 | 8.68 | 2.65 | Amb+10°F | 0 | 0 | 0 | 0 |
| Processing Building Vents MERGED STACK | 1 | PVENTM | Point | Y | | 70 | 21.34 | 27 | 8.23 | 7.523 | 2.29 | Amb+10°F | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT1 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT2 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT3 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 |
| Cooling Tower Cells | 1 | BIOCT4 | Point | Y | | 12.76042 | 3.89 | 20.32 | 6.193536 | 9.75 | 2.9718 | Amb+16°F | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | |
| **VOLUME SOURCES** | **#** | | | **Location known?** | **EMISFACT Restrictions** | **Release Height (ft)** | **Release Height (m)** | **Init Sig-Y (m)** | | **Init Sig-Z (m)** | | | **Bromodichloromethane** | **Heptane** | **1,2,4-Trimethylbenzene** | **Chlorobenzene** |
| Transfer Building Door (1hr) | 1 | DOORS1 | Volume | Y | | 14 | 4.27 | 4.68 | | 5.67 | | | 0 | 0 | 0 | 0 |
| Transfer Building Door (24hr) | 1 | DOORS24 | Volume | Y | | 14 | 4.27 | 4.68 | | 5.67 | | | 0 | 0 | 0 | 0 |
| Transfer Building Door (ANNUAL) | 1 | DOORSA | Volume | Y | | 14 | 4.27 | 4.68 | | 5.67 | | | 0 | 0 | 0 | 0 |
| Glass Processing North Bunker Area (1hr) | 1 | GLASSN1 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 0 | 0 | 0 | 0 |
| Glass Processing South Area (1hr) | 1 | GLASSS1 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 0 | 0 | 0 | 0 |
| Glass Processing North Bunker Area (24hr) | 1 | GLASSN24 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 0 | 0 | 0 | 0 |
| Glass Processing South Area (24hr) | 1 | GLASSS24 | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 0 | 0 | 0 | 0 |
| Glass Processing North Bunker Area (ANNUAL) | 1 | GLASSNA | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 0 | 0 | 0 | 0 |
| Glass Processing South Area (ANNUAL) | 1 | GLASSSA | Volume | Y | | 25.443 | 7.76 | 11.63 | | 7.21 | | | 0 | 0 | 0 | 0 |
| Truck Exhaust Inbound Scale | 1 | INSCALE | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 0 | 0 | 0 |
| Truck Exhaust Pause Area (Stop) 1 | 1 | STOP1 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 0 | 0 | 0 |
| Truck Exhaust Pause Area (Stop) 2 | 1 | STOP2 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 0 | 0 | 0 |
| Truck Exhaust Outbound Scale | 1 | OUTSCALE | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 0 | 0 | 0 |
| Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road | 1 | INT1 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 0 | 0 | 0 |
| Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road | 1 | INT2 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 0 | 0 | 0 |
| Phillips Road & Theodore Rice Boulevard/Braley Road | 1 | INT3 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 0 | 0 | 0 |
| Duchaine Boulevard & Theodore Rice Boulevard | 1 | INT4 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 0 | 0 | 0 |
| Duchaine Boulevard & Samuel Barnet Boulevard | 1 | INT5 | Volume | Y | 5am-9pm | 11.9 | 3.63 | 5.58 | | 3.37 | | | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | |
| **AREA SOURCES** | **#** | | | **Location known?** | **EMISFACT Restrictions** | **Release Height (ft)** | | **Init Sig-Z (m)** | | **Area (ft2)** | | | **Bromodichloromethane** | **Heptane** | **1,2,4-Trimethylbenzene** | **Chlorobenzene** |
| None | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| **LINE (AREA) SOURCES (roadway segments)** | **#** | | | **Location known?** | **EMISFACT Restrictions** | **Release Height (ft)** | **Release Height (m)** | **Init Sig-Z (m)** | | | | | **Bromodichloromethane** | **Heptane** | **1,2,4-Trimethylbenzene** | **Chlorobenzene** |
| Onsite - Entry to 1st Scale | 1 | ROAD1 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 0 | 0 | 0 |
| Onsite - 1st Scale to Tipping | 1 | ROAD2 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 0 | 0 | 0 |
| Onsite - Tipping to 2nd Scale | 1 | ROAD3 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 0 | 0 | 0 |
| Onsite - 2nd Scale to Exit | 1 | ROAD4 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 0 | 0 | 0 |
| Duchaine Blvd to Barnet (100% NB) | 1 | ROAD5 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 0 | 0 | 0 |
| Duchaine Blvd Barnet to Rice (100% NB) | 1 | ROAD6 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 0 | 0 | 0 |
| Rice Blvd to Rte 140 (100% NB) | 1 | ROAD7 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 0 | 0 | 0 |
| Rte 140 NB On-Ramp (100% NB) | 1 | ROAD8 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 0 | 0 | 0 |
| Rte 140 SB Off-Ramp (100% NB) | 1 | ROAD9 | Line | Y | 5am-9pm | 11.9 | 3.63 | 3.37 | | | | | 0 | 0 | 0 | 0 |

# Attachment C

## Air Dispersion Modeling Analyses Supporting Information

Parallel Products New England - New Bedford, MA
AERMOD Dispersion Modeling Analysis
NAAQS Results

| POLLUTANT | AVERAGING TIME | MAXIMUM MODELED CONCENTRATION ($\mu g/m^3$) | PERIOD of MODELED MAX (Year or YYMMDDHH) | Location (UTME, UTMN, Elev., Hill, Flag) | BACKGROUND CONCENTRATION ($\mu g/m^3$) | TOTAL CONCENTRATION ($\mu g/m^3$) | STANDARD ($\mu g/m^3$) | % of Standard |
|---|---|---|---|---|---|---|---|---|
| $SO_2$ | 1 HOUR (1) | 0.67185 | 2013-2017 | 337969.54, 4620236.45, 32.81, 35.26, 0.00 | 24.5 | 25.2 | 195 | 13% |
| | 3 HOUR (2) | 0.43785 | 17081403 | 337969.54, 4620156.45, 31.80, 31.80, 0.00 | 23.3 | 23.8 | 1300 | 2% |
| $PM_{10}$ | 24 HOUR (4) | 38.00260 | 13012924 | 337929.54, 4619976.45, 24.49, 34.84, 0.00 | 33.0 | 71.0 | 150 | 47% |
| $PM_{2.5}$ | 24 HOUR (5) | 7.43066 | 2013-2017 | 337929.54, 4619976.45, 24.49, 34.84, 0.00 | 17.5 | 24.9 | 35 | 71% |
| | ANNUAL (6) | 2.82435 | 2013-2017 | 337929.54, 4619976.45, 24.49, 34.84, 0.00 | 6.4 | 9.2 | 15 | 61% |
| $NO_2$ | 1 HOUR (7) | 177.04632 | 2013-2017 | 337969.54, 4620196.45, 32.29, 32.29, 0.00 | Included in modeled value | 177.0 | 188 | 94% |
| | ANNUAL (3) | 46.63069 | 2013 | 337949.54, 4620036.45, 26.58, 35.02, 0.00 | | 46.6 | 100 | 47% |
| CO | 1 HOUR (2) | 156.39534 | 16080406 | 337969.54, 4620236.45, 32.81, 35.26, 0.00 | 2005.5 | 2161.9 | 40000 | 5% |
| | 8 HOUR (2) | 96.64163 | 17120408 | 337769.54, 4619976.45, 23.75, 23.75, 0.00 | 1260.6 | 1357.2 | 10000 | 14% |

Notes:

(1) Maximum 4th-Highest Maximum Daily 1-Hr Concentration Averaged Over 5 Years
(2) Highest 2nd-High Concentration Over 5 Years
(3) Highest Annual Concentration Over 5 Years
(4) Highest 6th-High Concentration Over 5 Years
(5) Maximum 8th-Highest 24-Hour Concentration Averaged Over 5 Years
(6) Maximum Annual Concentration Averaged Over 5 Years
(7) Maximum 8th-Highest Maximum Daily 1-Hour Concentration Averaged Over 5 Years

# Parallel Products New England - New Bedford, MA

## AERMOD Dispersion Modeling Analysis

### NAAQS Results - Sensitive Receptors

| POLLUTANT | AVERAGING TIME | MAXIMUM MODELED CONCENTRATION ($\mu g/m^3$) | PERIOD of MODELED MAX (Year or YYMMDDHH) | Location (UTME, UTMN, Elev., Hill, Flag) | BACKGROUND CONCENTRATION ($\mu g/m^3$) | TOTAL CONCENTRATION ($\mu g/m^3$) | STANDARD ($\mu g/m^3$) | % of Standard |
|---|---|---|---|---|---|---|---|---|
| $SO_2$ | 1 HOUR (1) | 0.06878 | 2013-2017 | Pulaski Elementary (338252.99, 4621438.84) | 24.5 | 24.6 | 195 | 13% |
| | 1 HOUR (1) | 0.05866 | 2013-2017 | Campbell Elementary (338766.89, 4681472.33) | | 24.6 | 195 | 13% |
| | 1 HOUR (1) | 0.08096 | 2013-2017 | Creative Preschool (339200.77, 4619453.22) | | 24.6 | 195 | 13% |
| | 1 HOUR (1) | 0.05160 | 2013-2017 | Northstar Learning Center (335909.54, 4620636.45) | | 24.6 | 195 | 13% |
| | 3 HOUR (2) | 0.05549 | 13053103 | Pulaski Elementary (338252.99, 4621438.84) | 23.3 | 23.4 | 1300 | 2% |
| | 3 HOUR (2) | 0.05398 | 14062703 | Campbell Elementary (338766.89, 4681472.33) | | 23.4 | 1300 | 2% |
| | 3 HOUR (2) | 0.06285 | 14121524 | Creative Preschool (339200.77, 4619453.22) | | 23.4 | 1300 | 2% |
| | 3 HOUR (2) | 0.02505 | 15102121 | Northstar Learning Center (335909.54, 4620636.45) | | 23.3 | 1300 | 2% |
| $PM_{10}$ | 24 HOUR (4) | 1.47939 | 17111824 | Pulaski Elementary (338252.99, 4621438.84) | 33.0 | 34.5 | 150 | 23% |
| | 24 HOUR (4) | 1.30197 | 16012924 | Campbell Elementary (338766.89, 4681472.33) | | 34.3 | 150 | 23% |
| | 24 HOUR (4) | 1.07220 | 17110124 | Creative Preschool (339200.77, 4619453.22) | | 34.1 | 150 | 23% |
| | 24 HOUR (4) | 0.49321 | 14110924 | Northstar Learning Center (335909.54, 4620636.45) | | 33.5 | 150 | 22% |
| $PM_{2.5}$ | 24 HOUR (5) | 0.28751 | 2013-2017 | Pulaski Elementary (338252.99, 4621438.84) | 17.5 | 17.8 | 35 | 51% |
| | 24 HOUR (5) | 0.26466 | 2013-2017 | Campbell Elementary (338766.89, 4681472.33) | | 17.8 | 35 | 51% |
| | 24 HOUR (5) | 0.23906 | 2013-2017 | Creative Preschool (339200.77, 4619453.22) | | 17.7 | 35 | 51% |
| | 24 HOUR (5) | 0.06048 | 2013-2017 | Northstar Learning Center (335909.54, 4620636.45) | | 17.6 | 35 | 50% |
| | ANNUAL (6) | 0.05999 | 2013-2017 | Pulaski Elementary (338252.99, 4621438.84) | 6.4 | 6.4 | 15 | 43% |
| | ANNUAL (6) | 0.03416 | 2013-2017 | Campbell Elementary (338766.89, 4681472.33) | | 6.4 | 15 | 43% |
| | ANNUAL (6) | 0.03807 | 2013-2017 | Creative Preschool (339200.77, 4619453.22) | | 6.4 | 15 | 43% |
| | ANNUAL (6) | 0.00644 | 2013-2017 | Northstar Learning Center (335909.54, 4620636.45) | | 6.4 | 15 | 43% |
| $NO_2$ | 1 HOUR (7) | 75.40778 | 2013-2017 | Pulaski Elementary (338252.99, 4621438.84) | Included in Modeled Value | 75.4 | 188 | 40% |
| | 1 HOUR (7) | 73.11680 | 2013-2017 | Campbell Elementary (338766.89, 4681472.33) | | 73.1 | 188 | 39% |
| | 1 HOUR (7) | 72.45444 | 2013-2017 | Creative Preschool (339200.77, 4619453.22) | | 72.5 | 188 | 39% |
| | 1 HOUR (7) | 67.24258 | 2013-2017 | Northstar Learning Center (335909.54, 4620636.45) | | 67.2 | 188 | 36% |
| | ANNUAL (3) | 41.80283 | 2015 | Pulaski Elementary (338252.99, 4621438.84) | | 41.8 | 100 | 42% |
| | ANNUAL (3) | 41.56152 | 2016 | Campbell Elementary (338766.89, 4681472.33) | | 41.6 | 100 | 42% |
| | ANNUAL (3) | 41.57571 | 2016 | Creative Preschool (339200.77, 4619453.22) | | 41.6 | 100 | 42% |
| | ANNUAL (3) | 41.34652 | 2016 | Northstar Learning Center (335909.54, 4620636.45) | | 41.3 | 100 | 41% |
| CO | 1 HOUR (2) | 20.98959 | 13010620 | Pulaski Elementary (338252.99, 4621438.84) | 2005.5 | 2026.5 | 40000 | 5% |
| | 1 HOUR (2) | 19.30305 | 16081606 | Campbell Elementary (338766.89, 4681472.33) | | 2024.8 | 40000 | 5% |
| | 1 HOUR (2) | 23.89601 | 16110107 | Creative Preschool (339200.77, 4619453.22) | | 2029.4 | 40000 | 5% |
| | 1 HOUR (2) | 16.96223 | 17100123 | Northstar Learning Center (335909.54, 4620636.45) | | 2022.5 | 40000 | 5% |
| | 8 HOUR (2) | 7.80272 | 15091624 | Pulaski Elementary (338252.99, 4621438.84) | 1260.6 | 1268.4 | 10000 | 13% |
| | 8 HOUR (2) | 7.26087 | 14020408 | Campbell Elementary (338766.89, 4681472.33) | | 1267.9 | 10000 | 13% |
| | 8 HOUR (2) | 8.39220 | 15111008 | Creative Preschool (339200.77, 4619453.22) | | 1269.0 | 10000 | 13% |
| | 8 HOUR (2) | 3.11292 | 17062508 | Northstar Learning Center (335909.54, 4620636.45) | | 1263.7 | 10000 | 13% |

Notes:

(1) Maximum 4th-Highest Maximum Daily 1-Hr Concentration Averaged Over 5 Years
(2) Highest 2nd-High Concentration Over 5 Years
(3) Highest Annual Concentration Over 5 Years
(4) Highest 6th-High Concentration Over 5 Years
(5) Maximum 8th-Highest 24-Hour Concentration Averaged Over 5 Years
(6) Maximum Annual Concentration Averaged Over 5 Years
(7) Maximum 8th-Highest Maximum Daily 1-Hour Concentration Averaged Over 5 Years

# Summary of Snow Cover Analysis Results
## New Bedford Regional Airport - KEWB

| Summary | | | | | |
|---|---|---|---|---|---|
| | 2013 | 2014 | 2015 | 2016 | 2017 |
| January | Continuous Snow Cover | Late Autumn/Winter w/o Snow | Late Autumn/Winter w/o Snow | Late Autumn/Winter w/o Snow | Late Autumn/Winter w/o Snow |
| February | Late Autumn/Winter w/o Snow | Continuous Snow Cover | Continuous Snow Cover | Late Autumn/Winter w/o Snow | Late Autumn/Winter w/o Snow |
| March | Late Autumn/Winter w/o Snow | Late Autumn/Winter w/o Snow | Continuous Snow Cover | Late Autumn/Winter w/o Snow | Late Autumn/Winter w/o Snow |
| April | Transitional Spring | Transitional Spring | Transitional Spring | Transitional Spring | Transitional Spring |
| May | Transitional Spring | Transitional Spring | Transitional Spring | Transitional Spring | Transitional Spring |
| June | Midsummer | Midsummer | Midsummer | Midsummer | Midsummer |
| July | Midsummer | Midsummer | Midsummer | Midsummer | Midsummer |
| August | Midsummer | Midsummer | Midsummer | Midsummer | Midsummer |
| September | Autumn | Autumn | Autumn | Autumn | Autumn |
| October | Autumn | Autumn | Autumn | Autumn | Autumn |
| November | Late Autumn/Winter w/o Snow | Late Autumn/Winter w/o Snow | Late Autumn/Winter w/o Snow | Late Autumn/Winter w/o Snow | Late Autumn/Winter w/o Snow |
| December | Late Autumn/Winter w/o Snow | Late Autumn/Winter w/o Snow | Late Autumn/Winter w/o Snow | Late Autumn/Winter w/o Snow | Late Autumn/Winter w/o Snow |

Data from National Operational Hydrologic Remote Sensing Center Interactive Snow Information Website
http://www.nohrsc.noaa.gov/interactive/html/graph.html?station=KEWB&w=600&h=400&o=a&uc=0&by=2012&bm=1&bd=1&bh=0&ey=2012&em=12&ed=31&eh=23&data=1&units=0&region=us

| | |
|---|---|
| Station: | KEWB - NEW BEDFORD REGIONAL AIRPORT |
| Latitude: | 41.683333 N |
| Longitude: | 70.966667 W |
| Elevation: | 105 Feet |
| Start Date: | 2012-01-01 00 UTC |
| Stop Date: | 2012-12-31 23 UTC |
| Forest Density: | 7% |
| Land Use: | Cool Forest and Field |

Any month having >1" snow cover for greater than 60% of the hours was considered having “Continuous Snow Cover”.
April and May are always considered “Transitional Spring”
June/July/August are always "Midsummer"
September and October are always "Autumn"
November through March without snow cover is considered “Late Autumn/Winter Without Continuous Snow Cover”

# New Bedford Precipitation.xlsx

| Year | Annual Inches of Rain | Notes | 30th Percentile | 70th Percentile |
|---|---|---|---|---|
| 1996 | N/A | ASOS installed 3/20/96 | 42.08 | 49.19 |
| 1997 | N/A | No Data | | |
| 1998 | N/A | No Data | | |
| 1999 | 42.09 | | | |
| 2000 | 42.07 | | | |
| 2001 | 47.33 | | | |
| 2002 | 43.92 | | | |
| 2003 | 46.21 | | | |
| 2004 | 40.52 | | | |
| 2005 | 58.94 | | | |
| 2006 | 53.57 | | | |
| 2007 | 43.01 | | | |
| 2008 | 59.55 | | | |
| 2009 | 57.85 | | | |
| 2010 | 47.46 | | | |
| 2011 | 53.51 | | | |
| 2012 | 37.81 | | | |
| 2013 | 45.1 | | | |
| 2014 | 50.34 | | | |
| 2015 | 40.57 | | | |
| 2016 | 37.69 | | | |
| 2017 | 41.1 | | | |

| Year | Inches | Selected Moisture Profile |
|---|---|---|
| [redacted] | | |
| 2013 | 45.10 | Average |
| 2014 | 50.34 | Wet |
| 2015 | 40.57 | Dry |
| 2016 | 37.69 | Dry |
| 2017 | 41.1 | Dry |

# Attachment D

Air Toxics Analysis

| Chemical | Averaging Period | Max Concentration ($\mu g/m^3$) | TEL (24-hour) ($\mu g/m^3$) | Exceedance? | AAL (Annual) ($\mu g/m^3$) | Exceedance? | Note |
|---|---|---|---|---|---|---|---|
| 1,2,4-Trimethylbenzene | 24-Hour | 3.17E-04 | 200.0 | NO | | | 1 |
| | Annual | 4.00E-05 | | | 60.00 | NO | 1 |
| 1,3-Butadiene | 24-Hour | 5.66E-03 | 1.20 | NO | | | |
| | Annual | 7.20E-04 | | | 3.00E-03 | NO | |
| 2-Methylnaphythalene | 24-Hour | 6.53E-06 | 14.25 | NO | | | |
| | Annual | 7.79E-07 | | | 14.25 | NO | |
| Acetaldehyde | 24-Hour | 1.05E-01 | 30.00 | NO | | | |
| | Annual | 1.49E-02 | | | 0.40 | NO | |
| Acetone | 24-Hour | 9.32E-02 | 160.54 | NO | | | |
| | Annual | 1.29E-02 | | | 160.54 | NO | |
| Acrolein | 24-Hour | 2.86E-02 | 0.07 | NO | | | |
| | Annual | 4.75E-03 | | | 0.07 | NO | |
| Ammonia | 24-Hour | 2.12E+00 | 100.00 | NO | | | |
| | Annual | 2.84E-01 | | | 100.00 | NO | |
| Arsenic | 24-Hour | 6.90E-04 | 3.00E-03 | NO | | | |
| | Annual | 8.00E-05 | | | 3.00E-04 | NO | |
| Benzene | 24-Hour | 4.88E-02 | 0.60 | NO | | | |
| | Annual | 7.83E-03 | | | 0.10 | NO | |
| Beryllium | 24-Hour | 3.27E-06 | 1.00E-03 | NO | | | |
| | Annual | 3.89E-07 | | | 4.00E-04 | NO | |
| Bromomethane | 24-Hour | 1.57E-01 | 5.28 | NO | | | |
| | Annual | 2.04E-02 | | | 2.64 | NO | |
| Cadmium | 24-Hour | 2.99E-04 | 2.00E-03 | NO | | | |
| | Annual | 4.00E-05 | | | 2.00E-04 | NO | |
| Carbon Disulfide | 24-Hour | 7.59E-02 | 0.10 | NO | | | |
| | Annual | 9.92E-03 | | | 0.10 | NO | |
| Carbonyl Sulfide | 24-Hour | 2.99E-02 | 0.10 | NO | | | |
| | Annual | 3.93E-03 | | | 0.04 | NO | |
| Chloride | 24-Hour | 5.73E-03 | 7.00 | NO | | | |
| | Annual | 6.90E-04 | | | 4.69 | NO | |
| Chlorobenzene | 24-Hour | 1.50E-04 | 93.88 | NO | | | |
| | Annual | 2.00E-05 | | | 6.26 | NO | |
| Chloroethane | 24-Hour | 1.74E-03 | 717.55 | NO | | | |
| | Annual | 2.30E-04 | | | 358.78 | NO | |
| Chloroform | 24-Hour | 2.03E-01 | 132.76 | NO | | | |
| | Annual | 2.64E-02 | | | 0.04 | NO | |
| Chloromethane | 24-Hour | 2.71E-01 | 92.0 | NO | | | 1 |
| | Annual | 3.53E-02 | | | 90.0 | NO | 1 |
| Chromium | 24-Hour | 3.81E-04 | 1.36 | NO | | | |
| | Annual | 5.00E-05 | | | 1.36 | NO | |
| Copper | 24-Hour | 2.31E-04 | 0.54 | NO | | | |
| | Annual | 3.00E-05 | | | 0.54 | NO | |
| Dichlorobenzene | 24-Hour | 3.27E-04 | 81.74 | NO | | | |
| | Annual | 4.00E-05 | | | 0.18 | NO | |
| Dioxins | 24-Hour | 3.03E-09 | 4.50E-08 | NO | | | 2 |
| | Annual | 3.69E-10 | | | 4.50E-08 | NO | 2 |
| Ethanol | 24-Hour | 2.56E-03 | 51.24 | NO | | | |
| | Annual | 3.30E-04 | | | 51.24 | NO | |
| Ethyl Benzene | 24-Hour | 8.89E-03 | 300.0 | NO | | | |
| | Annual | 1.33E-03 | | | 300.00 | NO | |
| Formaldehyde | 24-Hour | 2.10E-01 | 2.0 | NO | | | |
| | Annual | 2.62E-02 | | | 0.08 | NO | |
| Furans | 24-Hour | 1.85E-09 | 0.40 | NO | | | |
| | Annual | 2.25E-10 | | | 0.02 | NO | |
| Hexane | 24-Hour | 4.90E-01 | 95.24 | NO | | | |
| | Annual | 5.90E-02 | | | 47.62 | NO | |
| Hydrogen Sulfide | 24-Hour | 2.76E-01 | 0.90 | NO | | | |
| | Annual | 3.66E-02 | | | 0.90 | NO | |
| Lead | 24-Hour | 1.36E-04 | 0.14 | NO | | | |
| | Annual | 2.00E-05 | | | 0.07 | NO | |
| Mercury | 24-Hour | 7.08E-05 | 3.00E-03 | NO | | | |
| | Annual | 1.00E-05 | | | 1.40E-03 | NO | |
| Methyl Etyl Ketone | 24-Hour | 1.11E-02 | 200.0 | NO | | | |
| | Annual | 1.60E-03 | | | 10.0 | NO | |
| Naphthalene | 24-Hour | 2.16E-02 | 14.25 | NO | | | |
| | Annual | 2.67E-03 | | | 14.25 | NO | |
| Nickel | 24-Hour | 1.10E-03 | 0.27 | NO | | | |
| | Annual | 1.40E-04 | | | 0.18 | NO | |
| Primary Exhaust PM2.5 | 24-Hour | 1.37E+00 | 5.0 | NO | | | 1 |
| | Annual | 2.02E-01 | | | 5.0 | NO | 1 |
| Selenium | 24-Hour | 6.53E-06 | 0.54 | NO | | | |
| | Annual | 7.79E-07 | | | 0.54 | NO | |
| Styrene | 24-Hour | 2.31E-03 | 200.0 | NO | | | |
| | Annual | 3.40E-04 | | | 2.00 | NO | |
| Toluene | 24-Hour | 4.42E-02 | 80.0 | NO | | | |
| | Annual | 8.01E-03 | | | 20.00 | NO | |
| Vanadium | 24-Hour | 6.26E-04 | 0.27 | NO | | | |
| | Annual | 7.00E-05 | | | 0.27 | NO | |
| Xylene | 24-Hour | 3.73E-02 | 11.80 | NO | | | |
| | Annual | 7.71E-03 | | | 11.80 | NO | |

1 EPA Iris
2 MassDEP Policy

**Notes to Air Toxics Analysis Result Table**

(a) TEL, AAL, or other health protective standard as described further in notes (d) and (g) below.
(b) Chloride maximum concentrations were evaluated relative to the TEL and AAL for hydrogen chloride.
(c) Dichlorobenzene (undefined isomers) was conservatively evaluated against the TEL for o-dichlorobenzene and AAL for p-dichlorobenzene.
(d) AALs and TELs are not published for dioxins. The maximum concentration of dioxins represented in this table is the sum of dioxins and furans. The criterion used for evaluation of this pollutant is published by MassDEP as of November 2017 ("Assessment & Control of Dioxin in Massachusetts") and represents 2,3,7,8-TCDD toxic equivalency factors (TEF).
(e) Hexane maximum concentrations were evaluated relative to the TEL and AAL for alkanes and alkenes.
(f) Mercury maximum concentrations were conservatively evaluated relative to the TEL and AAL for methyl mercury.
(g) AALs and TELs are not published for primary exhaust PM2.5 total (diesel exhaust particulate matter). The criterion used for evaluation is published by USEPA ("Integrated Risk Information System Chemical Assessment Summary") as of June 1, 1993, and this criterion (inhalation reference criterion) remains unchanged at this writing (February 8, 2019).

ATTACHMENT 15

# ENVIRONMENTAL JUSTICE

Massachusetts Environmental Policy Act
*Environmental Justice Analysis*

# Parallel Products of New England
## New Bedford, Massachusetts

*Submitted to:*
PARALLEL PRODUCTS OF NEW ENGLAND, INC.
100 Duchaine Boulevard
New Bedford, MA 02745

PARALLEL PRODUCTS

*Submitted by:*
**EPSILON ASSOCIATES, INC.**
3 Mill & Main Place, Suite 250
Maynard, MA 01754

Epsilon ASSOCIATES INC.

**September 20, 2019**

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# 1.0 EXECUTIVE SUMMARY

*Executive Summary*

Parallel Products of New England, Inc. (PPNE) has commissioned this Environmental Justice (EJ) analysis to document that the facility proposed for 100 Duchaine Boulevard in New Bedford, Massachusetts uses all feasible measures to avoid, minimize, and reduce potential air-related impacts on EJ populations within one-mile of the proposed solid waste facility. The proposed PPNE facility exceeds the Massachusetts Environmental Policy Act (MEPA) threshold for new solid waste processing capacity of 150 or more tons per day (TPD), and the wastewater mandatory threshold of 150 or more TPD of sewage sludge, triggering the requirement for filing of an Environmental Notification Form (ENF) and a mandatory Environmental Impact Report (EIR). Any project that exceeds the ENF thresholds for solid waste or wastewater and involves a project site located within one mile of an EJ population will be required to implement enhanced public participation under MEPA.

The project submitted an Expanded Environmental Notification Form (EENF) on February 20th, 2019 and was granted a Phase 1 Waiver for the Glass Processing operation in the EENF Certificate on April 12th, 2019. Phases 2 and 3 of the Project are required to submit a Draft Environmental Impact Report (DEIR). As part of the EENF Certificate the Project must continue to provide enhanced public outreach of the DEIR to EJ populations in New Bedford. The enhanced public participation requirements as described in the EENF certificate are listed below and PPNE's proposed implementation of each requirement is discussed.

*Enhanced Public Participation Under MEPA:*

1. *Preparation and Distribution of a fact sheet that provides a summary of the project, environmental impacts (including air quality), and public comment opportunities. The fact sheet should include photos of similar facilities (or direct individuals to a website to view renderings).*

   The fact sheet is currently in a draft form and includes a summary of the project, environmental impacts (including air quality) and a description of the public comment opportunities. Once finalized the Project fact sheet will be provided to the public library, City Hall as well as included on the Project website; and provided upon request by residents. The project website includes renderings of the proposed project.

2. *Prior to submitting the DEIR, the Project should contact the Toxics Action Center, EJ groups identified above (Coalition for Social Justice, Alternatives for Community & Environment, Hands Across the River Coalition, and Old Bedford Village), and the City's Planning Department for input on alternative media outlets and information repositories in which to provide notice of the DEIR.*

   The Proponent reached out to the groups identified above for input on alternative media outlets and information repositories to provide notice of the DEIR on July 15th, 2019.

3. *The Proponent should consult with the MassDEP and/or EEA's Environmental Justice Director during preparation of the DEIR regarding the proposed circulation and participation plan to ensure compliance with the EJ Policy.*

   As part of the EENF the Project consulted with MassDEP and the MEPA Office regarding the enhanced outreach requirements. The Project is intending to provide the following organizations with a copy of the DEIR: Coalition for Social Justice, Alternatives for Community & Environment, Hands Across the River, Toxics Action Center, and Old Bedford Village as well as publish Spanish and Portuguese language versions of the MEPA Public Notice in El Planeta and the Portuguese Times in addition to the New Bedford Standard Times.

4. *The DEIR should provide a detailed update that describes all of the proponent's enhanced public outreach efforts and meetings that have occurred since the EENF was submitted.*

   The Proponent held a public meeting on April 29th, 2019 at Pulaski School.

5. *Translation of materials or interpretation services prior to and during public meetings:* The project will continue to provide translators at the public hearing in Portuguese and Spanish

6. *Consider that when scheduling public meetings that the time of day, availability of public transportation and whether the location is child-friendly and culturally appropriate:* The project will consider these details when scheduling public meetings.

Any project that exceeds the mandatory EIR threshold for solid waste and involves a project site located within one mile of an EJ population will be required to conduct an enhanced analysis of impacts and mitigation under MEPA.

The remainder of this report will focus on details surrounding the enhanced analysis of impacts and mitigation and responding to EJ comments in the MEPA EENF Certificate.

### *Enhanced Analysis of Impacts*

As described in the 2017 Environmental Justice (EJ) Policy a project exceeding a mandatory EIR threshold for solid waste or wastewater must conduct an enhanced analysis of impacts:

*An enhanced analysis of impacts and mitigation may include analysis of multiple air impacts; data on baseline public health conditions within the affected EJ population; analysis of technological, site planning, and operational alternatives to reduce impacts; and proposed on-site and off-site mitigation measures to reduce multiple impacts and increase environmental and energy benefits for the affected EJ population.*

The adjacent EJ population is described in Section 2.2. The baseline public health conditions within the identified EJ population are described in Section 3. An analysis of multiple air impacts is described in Section 4. Mitigation measures designed to reduce impacts are described in Section 5. Responses to specific EJ comments received from the EENF are discussed in Section 6.

*Impacts*

Parallel Products proposes a facility that avoids, minimizes, and mitigates potential EJ air-related impacts as follows:

Avoided impacts: Parallel Products has selected an industrially-zoned setting to avoid impacts to the public and is re-using significant existing infrastructure to avoid impacts associated with new construction. Material handling in enclosed areas, using best industry practices, avoids off-site impacts of air emissions and odors. Because the proposed facility will serve existing needs for material handling at a location that is closer to the sources of the materials, the project avoids transportation-related impacts currently associated with sending the materials farther by truck. The project has revised truck traffic routes to avoid impacts to residences on Phillips Road.

Minimized impacts: The project team evaluated and modeled dozens of potential equipment and exhaust vent/stack configurations to identify the proposed conceptual design which minimizes off-site air and odor concentrations. The proposed design optimizes the flow of material through the site, and the reuse of existing facilities, while minimizing offsite impacts in general and residential area offsite impacts in particular. Material handling loaders will be USEPA Tier 4 certified to minimize emissions.

Mitigated impacts: Parallel Products is selecting to control odors from biosolids handling processes using either a biofilter with carbon polishing, or a regenerative thermal oxidizer, or equal, and ionization. These odor and air pollution control devices provide an enhanced degree of mitigation.

*Comparison to Standards*

The analysis shows that, under maximum expected operating conditions which include the stationary sources as well as the mobile on-site and off-site (i.e. traffic) sources and using conservative assumptions, that the project's air impacts will comply with all applicable health-protective standards. Specifically:

- The National Ambient Air Quality Standards (NAAQS) will not be exceeded. Per EPA, these standards "provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly.[1]"

- MassDEP has developed "health- and science-based air guidelines - known as Ambient Air Limits (AALs) and Threshold Effect Exposure Limits (TELs) - to evaluate potential human health risks from exposures to chemicals in air.[2]" The Massachusetts AALs and TELs will not be exceeded off property. In some cases, MassDEP had not developed an AAL or TEL for a particular chemical. In these cases, the USEPA Integrated Risk Information System

[1] https://www.epa.gov/criteria-air-pollutants/naaqs-table

[2] https://www.mass.gov/service-details/massdep-ambient-air-toxics-guidelines

(IRIS) was reviewed for that chemical to determine if a reference concentration (RFC) existed. The reference concentration is derived in a similar manner as the AAL and TEL concentrations and represents a concentration protective of the general population and sensitive subpopulations.

In Massachusetts, odor is regulated under 310 CMR 7.09 such that operations that emit odors shall not permit their emissions to "cause a condition of air pollution". To determine that the project is not a nuisance source of odors, the study evaluated for maximum 5-minute-averaged odor concentrations and determined that, for all locations off-site and given evaluated weather conditions, the odor concentration to be at or below 5 dilution-to-threshold (D/T). Thus, the project meets the criterion published in the MassDEP draft policy for odor from composting facilities.

# 2.0 INTRODUCTION

This report documents the enhanced analysis of impacts for the proposed Parallel Products of New England (PPNE) solid waste facility to be located at 100 Duchaine Boulevard in New Bedford, Massachusetts.

## 2.1 Site Description

The site is an industrially zoned, approximately 71-acre parcel, located within the New Bedford Business Park. The site location and property boundaries are shown in **Figure 1** using an aerial view. The site was previously developed by Polaroid and already includes access roads, parking areas, and various buildings. Much of the existing infrastructure will be used in developing the proposed project. New buildings will be constructed for glass processing, municipal solid waste (MSW) and construction and demolition (C&D) waste tipping, and biosolids drying. The conceptual layout of the future and existing buildings is shown in **Figure 2** which presents a plan view.

The site is bounded on the west by undevelopable wetlands, to the north by several commercial or industrial operations unrelated to PPNE's project, to the east by residential neighborhoods, and to the south by a utility operations and maintenance facility.

## 2.2 Project Description

PPNE plans to operate several solid waste and recycling related processes at the site:

(1) Phase 1 – Processing of redemption and recovered glass to cullet for rail haul to out-of-state recycling facilities [300 tons per day (TPD) glass handling capacity, 75,000 tons per year (TPY) throughput];

(2) Phase 2 – Processing of MSW to recover approximately 20 percent recyclables and to bale and rail haul the post-reclamation MSW, with C&D waste, to out-of-state waste disposal facilities (1,500 TPD MSW and C&D waste handling capacity, 450,000 TPY throughput);

(3) Phase 3 – Receipt of biosolids liquid sludge for dewatering to cake and receipt of biosolids cake, with drying of the cake to 93 percent solids for rail haul to out-of-state disposal facilities [50 dry TPD (DTPD) biosolids capacity, 15,000 dry TPY (DTPY) throughput].

While the goal is to rail haul most of the products and residuals off-site, the air emissions estimates, and related ambient impacts have been based on use of trucks to haul materials on and off-site. This will overstate the air impacts when compared to future, predominate use of rail haul.

## 2.3 Environmental Justice Populations

EJ populations are those segments of the population that the Executive Office of Environmental Affairs (EEA) has determined to be most at risk of being unaware of or unable to participate in environmental decision-making or to gain access to state environmental resources, or are especially vulnerable. They are defined as neighborhoods (U.S. Census Bureau census block group data for minority criteria, and American Community Survey (ACS) data for state median income and English isolation criteria) that meet *one or more* of the following:

- 25 percent of households within the census block group have a median annual household income at or below 65 percent of the statewide median income for Massachusetts; or

- 25 percent or more of the residents are minority; or

- 25 percent or more of the residents have English isolation.

EEA has designated specific areas of the state that meet one or more of the criteria above as EJ areas. Within one mile of the proposed site, there is an area designated as an EJ area for minority populations (in other words, 25 percent or more of the residents that reside in this are minority). The location of the site and areas designated as EJ areas are shown in **Figure 3**.

# 3.0 BASELINE HEALTH

This section describes the baseline health of the areas within one-mile of the proposed site which includes the communities of Acushnet, Dartmouth and New Bedford. The baseline health background is based on the data contained within the Massachusetts Environmental Public Health Tracking (MA EPHT) website. This website summarizes health outcomes based on data collected by the Massachusetts Division of Health Care Finance and data collected from the Massachusetts Department of Public Health (MassDPH) disease surveillance programs.

The MA EPHT website[3] contains data on a number of different health outcomes, including information on asthma hospitalizations and emergency room visits, the prevalence of asthma among school aged children, the hospitalization rate of acute myocardial infarctions, hospitalization and emergency room visits for Chronic Obstructive Pulmonary Disease (COPD), and incidence of various cancers. Each of these datasets are available at different geographies and data availability for recent years is limited. Table 3-1 describes the data reviewed for this project, the years available for review, and the geographic resolution of the health outcomes of interest. Each of these health outcomes is described further in the subsequent sections.

**Table 3-1 Baseline Health Outcomes Reviewed for the Project**

| Health Outcome | Indicator Description | Years Available | Geographic Resolution |
|---|---|---|---|
| Asthma Hospitalizations | Age-Adjusted Rate of Asthma Hospitalizations | 2000-2015 | Community |
| Asthma Emergency Department Visits | Age-Adjusted Rate of Emergency Department Visits for Asthma | 2000-2015 | Community |
| Cancer | Standardized Incidence Ratio Summarized by Cancer Type | 2000-2013 (results reported in 5-year blocks due to small numbers) | Census Tracts by Community |
| COPD Hospitalizations | Age Adjusted COPD Hospitalization Admission Rate | 2000-2015 | Community |
| COPD Emergency Department Visits | Age Adjusted COPD Emergency Department Visit Rate | 2000-2015 | Community |
| Acute Myocardial Infarction (AMI) Hospitalizations | Age-Adjusted Rate of AMI Hospitalizations | 2000-2015 | Community |
| Pediatric Asthma Prevalence | Prevalence of Asthma | 2009-2017 | By School |

3 https://matracking.ehs.state.ma.us/

## 3.1 Asthma Baseline Health

As described on the MA EPHT website[4], asthma is an illness that impacts the respiratory tract and airways that carry oxygen into and out of the lungs. During an asthma attack, the airways constrict resulting in wheezing and difficulty breathing. Causes of asthma are unknown. However, episodes of asthma (asthma attacks) can be triggered by certain environmental factors such as air pollution, mold, pets/pet dander, and dust mites. Asthma is a common chronic disease that continues to increase in prevalence. It is the most common chronic disease in children. Massachusetts has an elevated rate of asthma compared to the national prevalence rate.

MassDPH tracks asthma in several different ways: asthma hospitalizations, emergency room visits and school health records. A statewide surveillance program for elementary and middle-aged school children administered is through school health records.

### *3.1.1 Asthma Hospitalizations*

Asthma hospitalizations occur when an individual is admitted (i.e. stays overnight as an inpatient) to the hospital and receives treatment for asthma while hospitalized. Typically, an individual would enter the hospital through the emergency department and be admitted to the hospital as an inpatient. These individuals would be included in both the emergency department and asthma hospitalization datasets.

Data for asthma hospitalizations is only available on a community basis, and are tied to where an individual lives and not necessarily the location where the asthma attack occurred.

Rates of asthma hospitalizations are reported several ways, for this analysis the age-adjusted asthma hospitalization rate was compared to the statewide age-adjusted hospitalization rate in order to determine if the rate of asthma hospitalizations in the communities of Acushnet, Dartmouth and New Bedford were statistically-significantly-elevated compared to the statewide rate of asthma hospitalizations. The age-adjusted rate allows for comparisons to be made between populations with different age structures. The 5-year period of 2011-2015 (the most recent data available) was examined for this analysis. The age-adjusted asthma hospitalization rates for each of these communities appears in Table 3-2 below, rates of asthma hospitalizations for Acushnet and Dartmouth are similar to the statewide rate of asthma hospitalizations. New Bedford's asthma hospitalization rates are statistically-significantly-elevated when compared to the statewide rate of asthma, but the rate of asthma hospitalization has been declining over time.

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[4] https://matracking.ehs.state.ma.us/Health-Data/Asthma/index.html

Table 3-2 Age-Adjusted Rate of Asthma Hospitalization Admissions Compared to the Statewide Rate

| Town | Year | Age-Adjusted Rate (per 10,000 people) | 95% Confidence Interval[1] | Statistical Significance Compared to Statewide Rate |
|---|---|---|---|---|
| Acushnet | 2011 | 13.7 | 6.8 - 20.6 | Similar to statewide rate |
| | 2012 | 14.9 | 7.8 - 21.9 | Similar to statewide rate |
| | 2013 | Not Shown[2] | Not Shown[2] | Not Shown[3] |
| | 2014 | 12.6 | 5.2 - 20.1 | Similar to statewide rate |
| | 2015 | Not Shown[2] | Not Shown[2] | Not Shown[3] |
| Dartmouth | 2011 | 15.9 | 11.8 - 20.1 | Similar to statewide rate |
| | 2012 | 11.3 | 7.8 - 14.8 | Similar to statewide rate |
| | 2013 | 9.8 | 6.4 - 13.3 | Similar to statewide rate |
| | 2014 | 9.3 | 6.2 - 12.4 | Similar to statewide rate |
| | 2015 | 10.7 | 7.0-14.4 | Similar to statewide rate |
| New Bedford | 2011 | 39.2 | 35.2 - 43.1 | Statistically significantly higher than the statewide rate |
| | 2012 | 34.3 | 30.6 - 38 | Statistically significantly higher than the statewide rate |
| | 2013 | 28.5 | 25.1 - 31.9 | Statistically significantly higher than the statewide rate |
| | 2014 | 29.9 | 26.4 - 33.3 | Statistically significantly higher than the statewide rate |
| | 2015 | 23.4 | 20.2-26.3 | Statistically significantly higher than the statewide rate |
| Statewide | 2011 | 15.1 | 14.8-15.4 | Not Applicable |
| | 2012 | 13.3 | 13.0-13.6 | |
| | 2013 | 11.8 | 11.5-12.1 | |
| | 2014 | 12.0 | 11.8-12.3 | |
| | 2015 | 10.7 | 10.5-11.0 | |

[1] To determine if a community's asthma hospitalization rate is significantly different from the state rate or if the difference may be due solely to chance, a 95% confidence interval (CI) is calculated for each rate. A 95% CI assesses the magnitude and stability of a measure. Specifically, a 95% CI is the range of estimated values that has a 95% probability of including the true rate for the population.
[2] Not shown due to small numbers due to patient confidentiality considerations.

### *3.1.2 Asthma Emergency Department (ED) Visits*

Asthma-related emergency department (ED) visits occur when an individual receives treatment in the ED for asthma. In some instances, an individual may be treated and released. In other situations, an individual may be admitted to the hospital for further monitoring or treatment. These individuals would be included in both the ED and asthma hospitalization datasets.

Data for asthma-related ED visits is only available on a community basis, and are tied to where an individual lives and not necessarily the location where the asthma attack occurred.

Rates of asthma-related ED visits are reported several ways, for this analysis the age-adjusted rate was used as it allows for a comparison to be made to the statewide ED rate for asthma. The age-adjusted rate allows for comparisons to be made between populations with different age structures. The 5-year period of 2011-2015 (the most recent data available) was examined for this analysis. The age-adjusted asthma ED rates for each of these communities appears in Table 3-3 below, rates of asthma ED visits for Acushnet and Dartmouth are lower than the statewide rate of ED visits. New Bedford's asthma ED visits are statistically-significantly-elevated when compared to the statewide rate of asthma and have remained relatively unchanged in recent years.

## Table 3-3 Age-Adjusted Rate of Asthma-Related ED Visits Compared to Statewide Rate

| Town | Year | Age-Adjusted Rate (per 10,000 people) | 95% Confidence Interval[1] | Statistical Significance Compared to Statewide Rate |
|---|---|---|---|---|
| Acushnet | 2011 | 41.8 | 28.7 - 54.9 | Statistically significantly lower than the statewide rate |
| | 2012 | 49.8 | 35.9 - 63.7 | Statistically significantly lower than the statewide rate |
| | 2013 | 37.9 | 25.5 - 50.3 | Statistically significantly lower than the statewide rate |
| | 2014 | 51.6 | 36.5 - 66.6 | Statistically significantly lower than the statewide rate |
| | 2015 | 36.8 | 24.8-48.8 | Statistically significantly lower than the statewide rate |
| Dartmouth | 2011 | 44.7 | 37.3 - 52.2 | Statistically significantly lower than the statewide rate |
| | 2012 | 43.7 | 36.1 - 51.2 | Statistically significantly lower than the statewide rate |
| | 2013 | 44.6 | 37.1 - 52.2 | Statistically significantly lower than the statewide rate |
| | 2014 | 51.9 | 43.4 - 60.4 | Statistically significantly lower than the statewide rate |
| | 2015 | 43.4 | 35.9-50.8 | Statistically significantly lower than the statewide rate |
| New Bedford | 2011 | 123.7 | 116.5 - 130.9 | Statistically significantly higher than the statewide rate |
| | 2012 | 138.1 | 130.5 - 145.7 | Statistically significantly higher than the statewide rate |
| | 2013 | 127.8 | 120.5 - 135.1 | Statistically significantly higher than the statewide rate |
| | 2014 | 136.0 | 128.5 - 143.5 | Statistically significantly higher than the statewide rate |
| | 2015 | 119.2 | 112.2-126.2 | Statistically significantly higher than the statewide rate |
| Statewide | 2011 | 71.7 | 71.0-72.4 | Not Applicable |
| | 2012 | 72.9 | 72.2-73.5 | |
| | 2013 | 68.7 | 68.1-69.4 | |
| | 2014 | 70.9 | 70.2-71.5 | |
| | 2015 | 66.5 | 65.9-67.1 | |

[1] To determine if a community's asthma rate is significantly different from the state rate or if the difference may be due solely to chance, a 95% confidence interval (CI) is calculated for each rate. A 95% CI assesses the magnitude and stability of a measure. Specifically, a 95% CI is the range of estimated values that has a 95% probability of including the true rate for the population

### 3.1.3 Pediatric Asthma

MassDPH tracks asthma in children who are enrolled in public and private schools in order to learn how much asthma exists and which communities may have more asthma than others. MassDPH reports the prevalence of asthma by school and community. Prevalence is a measure of the percentage of students reported to have asthma during a school year.

Prevalence of pediatric asthma is reported several ways, for this analysis public schools serving populations within one-mile of the project site were compared to the statewide prevalence for asthma. The 5-year period of 2012-2017 (the most recent data available) was examined for this analysis. The prevalence of pediatric asthma for these schools appear in Table 3-4 below, the prevalence of pediatric asthma at the elementary schools is generally statistically significantly lower than the statewide prevalence. The pediatric prevalence at the middle school is generally statistically significantly higher than the statewide prevalence.

**Table 3-4 Prevalence of Pediatric Asthma by School Compared to the Statewide Rate**

| Town | School Year | Prevalence | 95% Confidence Interval[1] | Statistical Significance Compared to Statewide Prevalence |
|---|---|---|---|---|
| Casmir Pulaski School | 2012-2013 | 6.2 | 4.1-8.3 | Statistically significantly lower than the statewide prevalence of pediatric asthma |
| | 2013-2014 | 15.2 | 12-18.4 | Similar to the statewide prevalence |
| | 2014-2015 | 5.5 | 3.6-7.4 | Statistically significantly lower than the statewide prevalence of pediatric asthma |
| | 2015-2016 | 7.7 | 4.9-9.1 | Statistically significantly lower than the statewide prevalence of pediatric asthma |
| | 2016-2017 | 8.9 | 6.5-11.3 | Statistically significantly lower than the statewide prevalence of pediatric asthma |
| Campbell School | 2012-2013 | 2.7 | 0.5-4.9 | Statistically significantly lower than the statewide prevalence of pediatric asthma |
| | 2013-2014 | Not Shown | Not Shown | Not Shown |
| | 2014-2015 | 4.8 | 1.8-7.8 | Statistically significantly lower than the statewide prevalence of pediatric asthma |
| | 2015-2016 | 8.3 | 4.4-12.2 | Statistically significantly lower than the statewide prevalence of pediatric asthma |
| | 2016-2017 | 11.9 | 7.4-16.4 | Similar to statewide prevalence of pediatric asthma |
| Normandin Middle School | 2012-2013 | 19.7 | 17.0-22.4 | Statistically significantly higher than the statewide prevalence of pediatric asthma |
| | 2013-2014 | 20.3 | 17.6-23.0 | Statistically significantly higher than the statewide prevalence of pediatric asthma |
| | 2014-2015 | 19.6 | 16.9-22.3 | Statistically significantly higher than the statewide prevalence of pediatric asthma |
| | 2015-2016 | 21.2 | 18.5-23.9 | Statistically significantly higher than the statewide prevalence of pediatric asthma |
| | 2016-2017 | 21.2 | 18.5-23.9 | Statistically significantly higher than the statewide prevalence of pediatric asthma |

Table 3-4 Prevalence of Pediatric Asthma by School Compared to the Statewide Rate (Continued)

| Town | School Year | Prevalence | 95% Confidence Interval[1] | Statistical Significance Compared to Statewide Prevalence |
|---|---|---|---|---|
| Statewide | 2012-2013 | 12.1 | 12.0-12.2 | Not Applicable |
| | 2013-2014 | 12.4 | 12.3-12.5 | |
| | 2014-2015 | 12.2 | 12.1-12.3 | |
| | 2015-2016 | 12.4 | 12.3-12.5 | |
| | 2016-2017 | 12.1 | 12.0-12.2 | |

[1] To determine if a school's asthma pediatric prevalence is significantly different from the state rate or if the difference may be due solely to chance, a 95% confidence interval (CI) is calculated for each prevalence. A 95% CI assesses the magnitude and stability of a measure. Specifically, a 95% CI is the range of estimated values that has a 95% probability of including the true prevalence for the population

## 3.2 Cancer

As described on the MA EPHT website[5] cancer is a group of over 100 different types of diseases each with different risk factors. A risk factor is anything that increases a person's chance of developing cancer and may include hereditary conditions, medical conditions or treatments, lifestyle factors or environmental exposures. Cancer may be caused by several factors acting together over time. The World Health Organization (WHO) estimates that as much of 30% of cancer is preventable, mainly by not using tobacco, having a healthy diet, being physically active and preventing infections that may cause cancer. In general, many cancers have a long period of development.

The MA EPHT tracks cancer of more than 25 different types based on data obtained from the Massachusetts Cancer Registry. The MA EPHT website presents cancer data using two different types of statistics direct incidence ratio and a standardized incidence ratio For the purposes of this analysis the Standardized Incidence Ratio (SIR) is utilized as the direct incidence ratio is not appropriate for small populations (due to instability of small population numbers). The SIR allows for the comparison of cancer incidence in each community or census tract as a whole to the Massachusetts statewide incidence.

The SIR is the ratio of the observed number of cancer diagnoses in an area to the expected number of diagnoses multiplied by 100. An SIR of 100 indicates that the number of cancer diagnoses observed in the area of interest is equal to the number of cancer diagnoses expected in the comparison population. An SIR greater than 100 indicates that more cancer diagnoses occurred than expected, and an SIR less the 100 indicates that less cancer diagnoses occurred than expected. An SIR is accompanied by a 95% confidence interval to determine whether the SIR is statistically significant or could be due solely to chance. If the

[5] https://matracking.ehs.state.ma.us/Health-Data/Cancer/index.html

95% confidence interval does not include 100, there is less than a 5% percent chance that the observed difference in the SIR is the result of random fluctuation in the number of observed cancer diagnoses.

Although MA EPHT data is typically reported at the census tract (i.e. neighborhood geography), the entire community of New Bedford was selected for this analysis for several reasons. The proposed facility is located in New Bedford, and, due to the limited number of observed cases of cancer, information at the census tract level was suppressed (i.e. not calculated due to patient confidentiality concerns). Results from this analysis are reported in Table 3-5 below. In general the rates of most types of cancer in New Bedford were similar or statistically significantly lower than the rates of cancer on a statewide basis. However, the rates of five types of cancer are statistically elevated compared to the statewide rates. These five cancer types are: laryngeal, liver and bile duct, lung and bronchus, pancreatic, and stomach.

**Table 3-5 Incidence of Different Cancer in New Bedford Compared to the Statewide Incidence**

| Cancer Type | Time Period | Observed Cases | Expected Cases | Cancer SIR[1] | 95% Confidence Interval | Statistical Significance Compared to Statewide Rate |
|---|---|---|---|---|---|---|
| Childhood Brain & Central Nervous System Cancers | 2009-2013 | 4 | 4.6 | 88 | 24-225 | Similar to Statewide Rate |
| Childhood Hodgkin Lymphomas | 2009-2013 | 2 | 1.4 | 141 | 16-510 | Similar to Statewide Rate |
| Childhood Leukemia(s) | 2009-2013 | 2 | 5.7 | 35 | 4-126 | Similar to Statewide Rate |
| Childhood Non-Hodgkin Lymphomas | 2009-2013 | 0 | 1.4 | Not Calculated | Not Calculated | Not Calculated |
| All Other Types | 2009-2013 | 225 | 208.8 | 108 | 94-123 | Similar to Statewide Rate |
| Bladder Cancer | 2009-2013 | 44 | 63.9 | 69 | 50-92 | Statistically significantly lower than Statewide Rate |
| Brain and Other Nervous System Cancers | 2009-2013 | 32 | 35.4 | 90 | 62-128 | Similar to Statewide Rate |
| Breast Cancer | 2009-2013 | 348 | 389.7 | 89 | 80-99 | Statistically significantly lower than Statewide Rate |
| Colorectal Cancer | 2009-2013 | 229 | 218.5 | 105 | 92-119 | Similar to Statewide Rate |
| Esophagus Cancer | 2009-2013 | 42 | 32.4 | 130 | 93-175 | Similar to Statewide Rate |
| Hodgkin Lymphoma | 2009-2013 | 13 | 14.5 | 90 | 48-153 | Similar to Statewide Rate |
| Kidney and Renal Pelvis Cancer | 2009-2013 | 100 | 83.3 | 120 | 98-146 | Similar to Statewide Rate |
| Laryngeal Cancer | 2009-2013 | 39 | 19.1 | 205 | 145-280 | Statistically significantly greater than Statewide Rate |
| Leukemia | 2009-2013 | 63 | 70.7 | 75 | 56-98 | Statistically significantly lower than Statewide Rate |

Table 3-5 Incidence of Different Cancer in New Bedford Compared to the Statewide Incidence (Continued)

| Cancer Type | Time Period | Observed Cases | Expected Cases | Cancer SIR[1] | 95% Confidence Interval | Statistical Significance Compared to Statewide Rate |
|---|---|---|---|---|---|---|
| Liver and Intrahepatic Bile Duct | 2009-2013 | 75 | 43.9 | 171 | 134-214 | Statistically significantly greater than Statewide Rate |
| Lung and Bronchus Cancers | 2009-2013 | 456 | 364.7 | 125 | 114-137 | Statistically significantly greater than Statewide Rate |
| Melanoma of the Skin | 2009-2013 | 47 | 114.1 | 41 | 30-55 | Statistically significantly lower than Statewide Rate |
| Mesothelioma | 2009-2013 | 6 | 6.8 | 88 | 32-192 | Similar to Statewide Rate |
| Multiple Myeloma | 2009-2013 | 34 | 36.2 | 94 | 65-131 | Similar to Statewide Rate |
| Non-Hodgkin Lymphoma | 2009-2013 | 92 | 108.5 | 85 | 68-104 | Similar to Statewide Rate |
| Oral and Pharyngeal Cancers | 2009-2013 | 81 | 64.4 | 126 | 100-156 | Similar to Statewide Rate |
| Pancreatic Cancers | 2009-2013 | 95 | 72.1 | 132 | 107-161 | Statistically significantly greater than Statewide Rate |
| Stomach Cancer | 2009-2013 | 65 | 37.7 | 173 | 133-220 | Statistically significantly greater than Statewide Rate |
| Thyroid Cancer | 2009-2013 | 97 | 96.7 | 100 | 81-122 | Similar to Statewide Rate |
| Uterine Cancer | 2009-2013 | 89 | 86.5 | 103 | 83.127 | Similar to Statewide Rate |

[1] The standardized incidence ratio (SIR) is the ratio of the observed number of cancer diagnoses in an area to the expected number of diagnoses multiplied by 100.

## 3.3 Chronic Obstructive Pulmonary Disease (COPD)

As described on the MA EPHT website[6], chronic obstructive pulmonary disease (COPD) refers to a group of diseases including emphysema and chronic bronchitis, which block airflow and can cause difficulty breathing. COPD is considered a chronic health condition that typically worsens over time. Risk factors for COPD include smoking, and long-term exposure to air pollution, secondhand smoke, dust, fumes or chemicals.

MassDPH tracks COPD in two different ways: COPD hospitalizations and emergency room visits.

[6] https://matracking.ehs.state.ma.us/Health-Data/copd.html

### *3.3.1 COPD Hospitalizations*

COPD hospitalizations occur when an individual is admitted (i.e. stays overnight as an inpatient) to the hospital and receives treatment for COPD while hospitalized. Typically, an individual would enter the hospital through the emergency department and be admitted to the hospital as an inpatient. These individuals would be included in both the emergency department and COPD hospitalization datasets.

Rates of COPD hospitalizations are reported several ways, for this analysis the age-adjusted COPD hospitalization rate was compared to the statewide age-adjusted hospitalization rate in order to determine if the rate of COPD hospitalizations in the communities of Acushnet, Dartmouth and New Bedford were statistically-significantly-elevated compared to the statewide rate of COPD hospitalizations. The age-adjusted rate allows for comparisons to be made between populations with different age structures. The 5-year period of 2011-2015 (the most recent data available) was examined for this analysis. The age-adjusted COPD hospitalization rates for each of these communities appears in Table 3-6 below, rates of COPD hospitalizations for Acushnet and Dartmouth are generally and most recently similar to the statewide rate of COPD hospitalizations. New Bedford's COPD hospitalization rates are statistically-significantly-elevated when compared to the statewide rate of COPD, but this rate has been declining over time.

**Table 3-6 Age-Adjusted Rate of COPD Hospitalization Admissions Compared to the Statewide Rate**

| Town | Year | Age-Adjusted Rate (per 10,000 people) | 95% Confidence Interval[1] | Statistical Significance Compared to Statewide Rate |
|---|---|---|---|---|
| Acushnet | 2011 | 45.4 | 31.5 - 59.3 | Similar to statewide rate |
| | 2012 | 21.4 | 11.8 - 31 | Similar to statewide rate |
| | 2013 | 21.9 | 12.3 - 31.5 | Similar to statewide rate |
| | 2014 | 28.1 | 17.3 - 38.9 | Similar to statewide rate |
| | 2015 | 22.7 | 13.2-32.2 | Similar to statewide rate |
| Dartmouth | 2011 | 44 | 36.3 - 51.6 | Statistically significantly higher than the statewide rate |
| | 2012 | 28.6 | 22.6 - 34.6 | Similar to statewide rate |
| | 2013 | 29.1 | 23.2 - 35.1 | Similar to statewide rate |
| | 2014 | 22 | 16.7 - 27.3 | Similar to statewide rate |
| | 2015 | 28.4 | 22.6-34.2 | Similar to statewide rate |
| New Bedford | 2011 | 97.8 | 90.4 - 105.2 | Statistically significantly higher than the statewide rate |
| | 2012 | 78.8 | 72.3 - 85.3 | Statistically significantly higher than the statewide rate |
| | 2013 | 68.1 | 62.1 - 74.1 | Statistically significantly higher than the statewide rate |
| | 2014 | 50.4 | 45.2 - 55.6 | Statistically significantly higher than the statewide rate |
| | 2015 | 59.3 | 53.7-64.8 | Statistically significantly higher than the statewide rate |

Table 3-6 Age-Adjusted Rate of COPD Hospitalization Admissions Compared to the Statewide Rate (Continued)

| Town | Year | Age-Adjusted Rate (per 10,000 people) | 95% Confidence Interval[1] | Statistical Significance Compared to Statewide Rate |
|---|---|---|---|---|
| Statewide | 2011 | 33.7 | 33.2-34.2 | Not Applicable |
| | 2012 | 29.9 | 29.4-30.4 | |
| | 2013 | 27.0 | 26.6-27.4 | |
| | 2014 | 25.0 | 24.6-25.5 | |
| | 2015 | 26.3 | 25.9-26.7 | |

[1] To determine if a community's COPD hospitalization rate is significantly different from the state rate or if the difference may be due solely to chance, a 95% confidence interval (CI) is calculated for each rate. A 95% CI assesses the magnitude and stability of a measure. Specifically, a 95% CI is the range of estimated values that has a 95% probability of including the true rate for the population.

### *3.3.2 COPD Emergency Department (ED) Visits*

COPD-related ED visits occur when an individual receives treatment in the ED for COPD. In some instances an individual may be treated and released. In other situations an individual may be admitted to the hospital for further monitoring or treatment these individuals would be included in both the ED visits and COPD hospitalization datasets.

Rates of COPD-related ED visits are reported several ways, for this analysis the age-adjusted rate was used as it allows for a comparison to be made to the statewide ED rate for COPD. The age-adjusted rate allows for comparisons to be made between populations with different age structures. The 5-year period of 2011-2015 (the most recent data available) was examined for this analysis. The age-adjusted COPD ED rates for each of these communities appears in Table 3-7 below, rates of COPD ED visits for Acushnet and Dartmouth are lower than the statewide rate of ED visits. New Bedford's COPD ED visits are statistically-significantly-elevated when compared to the statewide rate of COPD and the rate of COPD ED visits has remained relatively unchanged over the 5-year period examined.

Table 3-7 Age-Adjusted Rate of COPD-Related ED Visits Compared to Statewide Rate

| Town | Year | Age-Adjusted Rate (per 10,000 people) | 95% Confidence Interval[1] | Statistical Significance Compared to Statewide Rate |
|---|---|---|---|---|
| Acushnet | 2011 | 70.9 | 53 - 88.9 | Similar to statewide rate |
| | 2012 | 42.2 | 28.4 - 55.9 | Statistically significantly lower than statewide rate |
| | 2013 | 51 | 35.4 - 66.6 | Similar to statewide rate |
| | 2014 | 69.3 | 51.6 - 87 | Similar to statewide rate |
| | 2015 | 58.8 | 42.5-75.2 | Similar to statewide rate |

Table 3-7 Age-Adjusted Rate of COPD-Related ED Visits Compared to Statewide Rate (Continued)

| Town | Year | Age-Adjusted Rate (per 10,000 people) | 95% Confidence Interval[1] | Statistical Significance Compared to Statewide Rate |
|---|---|---|---|---|
| Dartmouth | 2011 | 77.9 | 67.1 - 88.8 | Similar to statewide rate |
| | 2012 | 56.8 | 47.7 - 66 | Statistically significantly lower than statewide rate |
| | 2013 | 60.6 | 51.3 - 69.9 | Similar to statewide rate |
| | 2014 | 56.6 | 47.4 - 65.8 | Similar to statewide rate |
| | 2015 | 71.2 | 61.2-81.2 | Similar to statewide rate |
| New Bedford | 2011 | 184.2 | 173.8 - 194.7 | Statistically significantly higher than statewide rate |
| | 2012 | 162.4 | 152.7 - 172.1 | Statistically significantly higher than statewide rate |
| | 2013 | 147.1 | 138 - 156.2 | Statistically significantly higher than statewide rate |
| | 2014 | 150.9 | 141.6 - 160.1 | Statistically significantly higher than statewide rate |
| | 2015 | 171.2 | 161.5-181.0 | Statistically significantly higher than statewide rate |
| Statewide | 2011 | 71.4 | 70.7-72.2 | Not Applicable |
| | 2012 | 69.8 | 69.1-70.6 | |
| | 2013 | 64.7 | 64.0-65.4 | |
| | 2014 | 62.3 | 61.6-63.0 | |
| | 2015 | 63.4 | 62.7-64.1 | |

[1] To determine if a community's COPD ED rate is significantly different from the state rate or if the difference may be due solely to chance, a 95% confidence interval (CI) is calculated for each rate. A 95% CI assesses the magnitude and stability of a measure. Specifically, a 95% CI is the range of estimated values that has a 95% probability of including the true rate for the population

## 3.4 Acute Myocardial Infarction (AMI)

As described on the MA EPHT website[7], an acute myocardial infarction (AMI), is also known as a heart attack. AMI, along with stroke, and other heart and blood vessel diseases are responsible for approximately 35% of all deaths in Massachusetts. There are a number of risk factors associated with AMI, including health, life style and environmental factors. Environmental factors include exposure to certain air pollutants.

MassDPH tracks AMI through hospitalizations, as nearly every AMI results in an inpatient admission.

### *3.4.1 AMI Hospitalizations*

AMI hospitalizations occur when an individual is admitted (i.e. stays overnight as an inpatient) to the hospital and receives treatment for a heart attack while hospitalized. Typically, an individual would enter the hospital through the emergency department and be admitted to the hospital as an inpatient. These individuals would be included in both the

[7] https://matracking.ehs.state.ma.us/Health-Data/Heart_Attack_Hospitalization.html

AMI emergency department visit and AMI hospitalization datasets. However, as most AMI emergency department visits result in an admission to the hospital, MassDPH only tracks AMI hospitalizations.

Rates of AMI hospitalizations are reported several ways, for this analysis the age-adjusted AMI hospitalization rate was compared to the statewide age-adjusted hospitalization rate in order to determine if the rate of AMI hospitalizations in the communities of Acushnet, Dartmouth and New Bedford were statistically-significantly-elevated compared to the statewide rate of AMI hospitalizations. The age-adjusted rate for AMI considers individuals 35 years of age and older and allows for comparisons to be made between populations with different age structures. The 5-year period of 2011-2015 (the most recent data available) was examined for this analysis. The age-adjusted AMI hospitalization rates for each of the communities of interest appears in Table 3-8 below, rates of AMI hospitalizations for Acushnet and Dartmouth are generally similar to the statewide rate of AMI hospitalizations for most years. New Bedford's MI hospitalization rates are statistically-significantly-elevated when compared to the statewide rate of MI and have remained relatively flat over the 5-year period.

**Table 3-8 Age-Adjusted Rate of Acute Myocardial Infarction Hospitalization Admissions Compared to the Statewide Rate**

| Town | Year | Age-Adjusted Rate (per 10,000 people) | 95% Confidence Interval[1] | Statistical Significance Compared to Statewide Rate |
|---|---|---|---|---|
| Acushnet | 2011 | 18.8 | 9 - 28.7 | Statistically significantly lower than the statewide rate. |
| | 2012 | 26.1 | 14.6 - 37.5 | Similar to the statewide rate |
| | 2013 | 39.5 | 24.9 - 54.2 | Similar to the statewide rate |
| | 2014 | 40.9 | 26 - 55.8 | Statistically significantly higher than the statewide rate. |
| | 2015 | 30.8 | 18.5-43.2 | Similar to the statewide rate |
| Dartmouth | 2011 | 37 | 28.9 - 45 | Similar to the statewide rate |
| | 2012 | 35.2 | 27.4 - 42.9 | Similar to the statewide rate |
| | 2013 | 27.9 | 21.1 - 34.7 | Similar to the statewide rate |
| | 2014 | 29.8 | 23 - 36.5 | Similar to the statewide rate |
| | 2015 | 32.6 | 25.7-39.6 | Similar to the statewide rate |
| New Bedford | 2011 | 47.3 | 41.7 - 52.9 | Statistically significantly higher than the statewide rate. |
| | 2012 | 51.9 | 46 - 57.8 | Statistically significantly higher than the statewide rate. |
| | 2013 | 41.2 | 35.9 - 46.4 | Statistically significantly higher than the statewide rate. |
| | 2014 | 39.2 | 34.1 - 44.3 | Statistically significantly higher than the statewide rate. |
| | 2015 | 47.7 | 42.1-53.2 | Statistically significantly higher than the statewide rate. |

**Table 3-8 Age-Adjusted Rate of Acute Myocardial Infarction Hospitalization Admissions Compared to the Statewide Rate (Continued)**

| Town | Year | Age-Adjusted Rate (per 10,000 people) | 95% Confidence Interval[1] | Statistical Significance Compared to Statewide Rate |
|---|---|---|---|---|
| Statewide | 2011 | 30.8 | 30.2-31.3 | Not Applicable |
| | 2012 | 30.1 | 29.5-30.6 | |
| | 2013 | 26.7 | 26.2-27.2 | |
| | 2014 | 24.9 | 24.4-25.3 | |
| | 2015 | 26.8 | 26.3-27.3 | |

[1] To determine if a community's AMI hospitalization rate is significantly different from the state rate or if the difference may be due solely to chance, a 95% confidence interval (CI) is calculated for each rate. A 95% CI assesses the magnitude and stability of a measure. Specifically, a 95% CI is the range of estimated values that has a 95% probability of including the true rate for the population.

## 3.5 Baseline Health Considerations

As indicated on the MassEPHT website[8] chronic diseases are the leading cause of illness and death both nationally and in Massachusetts. Many of these diseases are believed to result from the interaction of both genes and environmental factors. Environmental factors include infectious agents (i.e. viruses and bacteria), environmental contaminants, and diet and lifestyle choices. However, the extent at which each of these individual factors contribute to the development of chronic disease is not known. The health data presented are intended to provide a basic level of understanding of the disease burden in Massachusetts communities.

[8] https://matracking.ehs.state.ma.us/Health-Data/index.html

# 4.0 MULTI-POLLUTANT ANALYSIS

As described in the air and odor analysis report, an analysis was conducted that accounted for the air emissions from the proposed facility. The air emissions were modeled using an air dispersion model to determine ambient air concentration impacts from the facility. The air modeling performed included evaluation of criteria pollutants and air toxics, terrain features, local meteorology and buildings. The air modeling has been described previously in the air and odor analysis report and was relied upon for this EJ analysis. Other pathways of exposure (i.e. water, soil) were not evaluated as the dominant exposure pathway is expected to be the air pathway and the MEPA EJ policy specifically requires evaluation of the air-related impacts of the facility.

## 4.1 Emissions

Emission units at the proposed facility are categorized as stationary and mobile sources and include the following broad categories: Biosolids Dryers and Building Heat Boiler, Biosolids Process Sources, Biosolids Cooling Tower, Municipal Solid Waste (MSW) Solid Waste Tipping and Processing, Glass Processing (including Building Space Heaters), Paved Roads, and Onsite and Off-site Mobile Sources. Mass emission rates from each of these categories of sources were conservatively modeled assuming they generally occur simultaneously at the maximum anticipated rate. The air emissions considered and the methodologies used for calculating the emission rates are described further in the air and odor analysis report.

## 4.2 Air Dispersion Modeling

As described in the air and odor analysis report, the AERMOD model [the United States Environmental Protection Agency (USEPA) preferred model] was utilized to generate concentrations of air pollutants outside the property boundary of the proposed project. AERMOD incorporates information including emissions, local meteorological data, orientation of buildings, stack configurations, and terrain data in order to predict concentrations of air pollutants outside the property boundary of the proposed project. Further details are described in the air and odor analysis report. Results from this analysis were used for comparison to relevant health-based standards which are described further below.

## 4.3 Criteria Air Pollutants

Criteria air pollutants are regulated by the USEPA through National Ambient Air Quality Standards (NAAQS). The EPA has established NAAQS standards for pollutants considered to be harmful to the public health and the environment. These standards can be further broken down into primary and secondary standards. Primary standards are intended to protect human health, including the health of "sensitive" populations such as asthmatics, children and the elderly. The secondary standards are intended to provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

USEPA has established NAAQS for the following pollutants: carbon monoxide (CO), nitrogen dioxide ($NO_2$), coarse particulate matter ($PM_{10}$), fine particulate matter ($PM_{2.5}$), sulfur dioxide ($SO_2$), ozone ($O_3$), and lead (Pb). Air pollutants included in the air and odor analysis, for which NAAQS are published, are CO, $NO_2$ , $PM_{10}$, $PM_{2.5}$, and $SO_2$. Lead is included in the air toxics analysis, and air toxics criteria for lead are more stringent than the NAAQS for lead.

To address the NAAQS, mass emission rates for each of the included criteria air pollutants (ozone is not typically modeled for a source of this size) were estimated for both stationary and mobile sources at the proposed facility, ambient concentrations from all sources were modeled, and the maximum modeled concentrations were compared to the NAAQS to ensure there are no off-site exceedances.

## 4.4 Air Toxics

Air toxic compounds, including lead, were selected for emissions estimation based on the MassDEP Ambient Air Toxics Guidelines. In general, chemicals for which MassDEP has published allowable ambient limits (AALs) and threshold effect exposure limits (TELs), and for which specific emission factors were available, are included in the analysis.

MassDEP determines the AALs and TELS through an analysis of health effects. The first step in developing an AAL and TEL is to look at the carcinogenic and non-carcinogenic health effects of the chemicals.

Known or suspected carcinogenic health effects make up the basis of the Non-Threshold Effects Exposure Limits (NTELs) which are associated with a one in a million excess cancer risk over a lifetime of continuous exposure to the chemical.

The TEL addresses the non-cancer health effects and is intended to protect the general population from adverse health effects over a lifetime of exposure to the chemical. The TEL includes impacts on sensitive populations such as children and takes into account other pathways for exposure to the chemical than just ambient air. These other pathways that are evaluated in the TEL determination include indoor air, food, soil, and water.

MassDEP then compares the NTEL and TEL and assigns whichever concentration is lower as the AAL to make sure both cancer and non-cancer health impacts are mitigated to the fullest extent possible. For most carcinogenic compounds, AALs are typically based on the NTELs since the NTEL tends to be lower than the TEL for these compounds. For non-carcinogenic compounds, the AAL will be based on the TEL which results in the published AAL and TEL values being identical. It is important to note that exposure above an AAL or TEL does not necessarily mean there will be adverse health impacts, but rather that the risk of these adverse effects increases with the frequency of exposure above these levels.

In some cases, MassDEP did not have an AAL or TEL for a particular chemical. In these cases, the USEPA Integrated Risk Information System was reviewed for that chemical to determine if a reference concentration (RFC) existed. The reference concentration is derived in a similar manner as the AAL and TEL concentrations and represents a concentration protective of the general population and sensitive subpopulations.

To address the air toxics guidelines, air toxic mass emission rates were estimated for both stationary and mobile sources at the proposed facility, ambient concentrations from all sources were modeled, and the maximum modeled concentrations were compared to the AAL (on an annual average basis) and TEL (on a short-term basis) or RFC to ensure there are no exceedances offsite.

## 4.5 Ambient Air Analysis Conclusions

As described above an ambient air impacts analysis was conducted to understand the impacts from the proposed facility from multiple air pollutants (two important criteria pollutants and a number of air toxics). Impacts for all pollutants were below health protective levels of concern at all offsite locations based on the peak predicted level of operation of the proposed facility. Operation of this facility will not cause or contribute to any health-protective exceedances of air quality concentrations. Results are reported in the air and odor report, along with the location of the predicted maximum concentration.

# 5.0 MITIGATION

As part of the enhanced environmental justice analysis mitigation of on-site and off-site activities must be considered. This section describes the mitigation steps that have been taken to minimize impacts on the surrounding residences.

The analysis in Section 4.0 shows that, under maximum expected operating conditions which include the stationary sources as well as the mobile on-site and off-site (i.e. traffic) sources and using conservative assumptions, that the project's air impacts will comply with all applicable health-protective standards. Specifically:

- The National Ambient Air Quality Standards (NAAQS) will not be exceeded. Per EPA, these standards "provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly.[9]"
- MassDEP has developed "health- and science-based air guidelines - known as Ambient Air Limits (AALs) and Threshold Effect Exposure Limits (TELs) - to evaluate potential human health risks from exposures to chemicals in air.[10]" The Massachusetts AALs and TELs will not be exceeded offsite.
- If MassDEP had not developed a specific AAL or TEL for a given chemical, the EPA Integrated Risk Information System was reviewed to determine if the EPA had developed a Reference Concentration.[11] The EPA reference concentrations will not be exceeded offsite.

In Massachusetts, odor is regulated under 310 CMR 7.09 such that operations that emit odors shall not permit their emissions to "cause a condition of air pollution". To determine that the project is not a nuisance source of odors, the study evaluated for maximum 5-minute-averaged odor concentrations and determined that, for all locations on-site and off-site and given evaluated weather conditions, the odor concentration to be at or below 5 dilution-to-threshold (D/T). Thus the project meets the criterion published in the MassDEP draft policy for odor from composting facilities.

9 https://www.epa.gov/criteria-air-pollutants/naaqs-table

10 https://www.mass.gov/service-details/massdep-ambient-air-toxics-guidelines

11 https://www.epa.gov/iris/basic-information-about-integrated-risk-information-system

## 5.1 Mitigation Opportunities

*Vegetated Buffers and Other Plantings*

As described in the air and odor modeling report, emissions from the proposed project are relatively minor in magnitude and may not require an air permit from MassDEP. However, current renderings for the site leave much of the existing tree line located along the property lines intact. This will serve as a visual buffer to the site during non-winter months and act as a vegetative and physical barrier which may reduce concentrations (vegetative barriers are not accounted for in the air dispersion modeling). Although the effectiveness of a barrier on reducing air pollution is a function of the spacing of the barrier, thickness of the barrier, and height of the barrier.

One of the mitigation measures implemented is to restrict truck traffic from traveling north and south on Phillips Road; the majority of truck traffic is instead routed through a predominantly industrialized area. This project change effectively creates a buffer for the residences on Phillips Road from the majority of the truck traffic traveling to and from the Project site.

*Climate Change*

The impacts from Climate Change on the northeast were recently captured in the Fourth National Climate Assessment.[12] The impacts in urban areas are anticipated to include: extreme temperature events, episodes of poor air quality, recurrent waterfront and coastal flooding, and intense precipitation events that can lead to increased flooding; however the report acknowledges that our understanding of the extent of impacts from climate change is incomplete.

In order to better understand the severity of the impacts of extreme temperature events, the Massachusetts EPHT[13] database was examined in order to determine if the rate of heat related illness hospitalizations and emergency department visits was statistically elevated when compared statewide levels (from 2011-2015). Heat related illness hospitalizations were not elevated either at the community or county levels and heat related emergency department visits were not elevated at the community level. Heat related illness emergency departments were only elevated at the county level for 2012 with the rest of the years being statistically similar to the statewide rate.

In terms of episodes of poor air quality, the number of air stagnation watches or warnings issued by the National Weather Service (NWS), the weather forecasting agency for the National Oceanic and Atmospheric Administration (NOAA); was examined in order to

[12] https://nca2018.globalchange.gov/chapter/18/

[13] http://matracking.ehs.state.ma.us/Health-Data/heat-stress-hospitalization.html#MyPopup

determine if watches/warnings were being issued at a higher rate more recently. Data on watches and warnings were retrieved from 1986 to 2018 for Bristol County, MA.[14] Review of the data did not find a single instance where the NWS issued a watch or warning for an air stagnation event.

*Air Quality*

The facility does plan to monitor emissions on a monthly basis, per MassDEP requirements, for the purpose of documenting its de minimis status relative to air permitting, or, if a plan approval is required, for the purpose of documenting compliance with the permitted air emission limits. In addition, the Project has begun preparation of a system to log and track odor, noise and dust complaints and will share this system with MassDEP and the City's Health Agent once it's finalized for their input.

## 5.2 Conclusions

Parallel Products proposes a facility that avoids, minimizes, and mitigates potential EJ air-related impacts as follows:

Avoided impacts: Parallel Products has selected an industrially-zoned setting to avoid impacts to the public and is re-using significant existing infrastructure to avoid impacts associated with new construction. Material handling in enclosed areas, using best industry practices, avoids off-site impacts of air emissions and odors. Because the proposed facility will serve existing needs for material handling at a location that is closer to the sources of the materials, the project avoids transportation-related impacts currently associated with sending the materials farther by truck. The project has revised truck traffic routes to avoid impacts to residences on Phillips Road.

Minimized impacts: The project team evaluated and modeled dozens of potential equipment and exhaust vent/stack configurations to identify the proposed conceptual design which minimizes off-site air and odor concentrations. The proposed design optimizes the flow of material through the site, and the reuse of existing facilities, while minimizing offsite impacts in general and residential area offsite impacts in particular. Material handling loaders will be USEPA Tier 4 certified to minimize emissions. The project will track air emissions on a monthly basis and is developed a system to log and track odor, noise and dust complaints.

Mitigated impacts: Parallel Products is selecting to control odors from biosolids handling processes using either a biofilter with carbon polishing, or a regenerative thermal oxidizer, or equal, and ionization. These odor and air pollution control devices provide an enhanced degree of mitigation.

14 https://mesonet.agron.iastate.edu/vtec/search.php

# Figures

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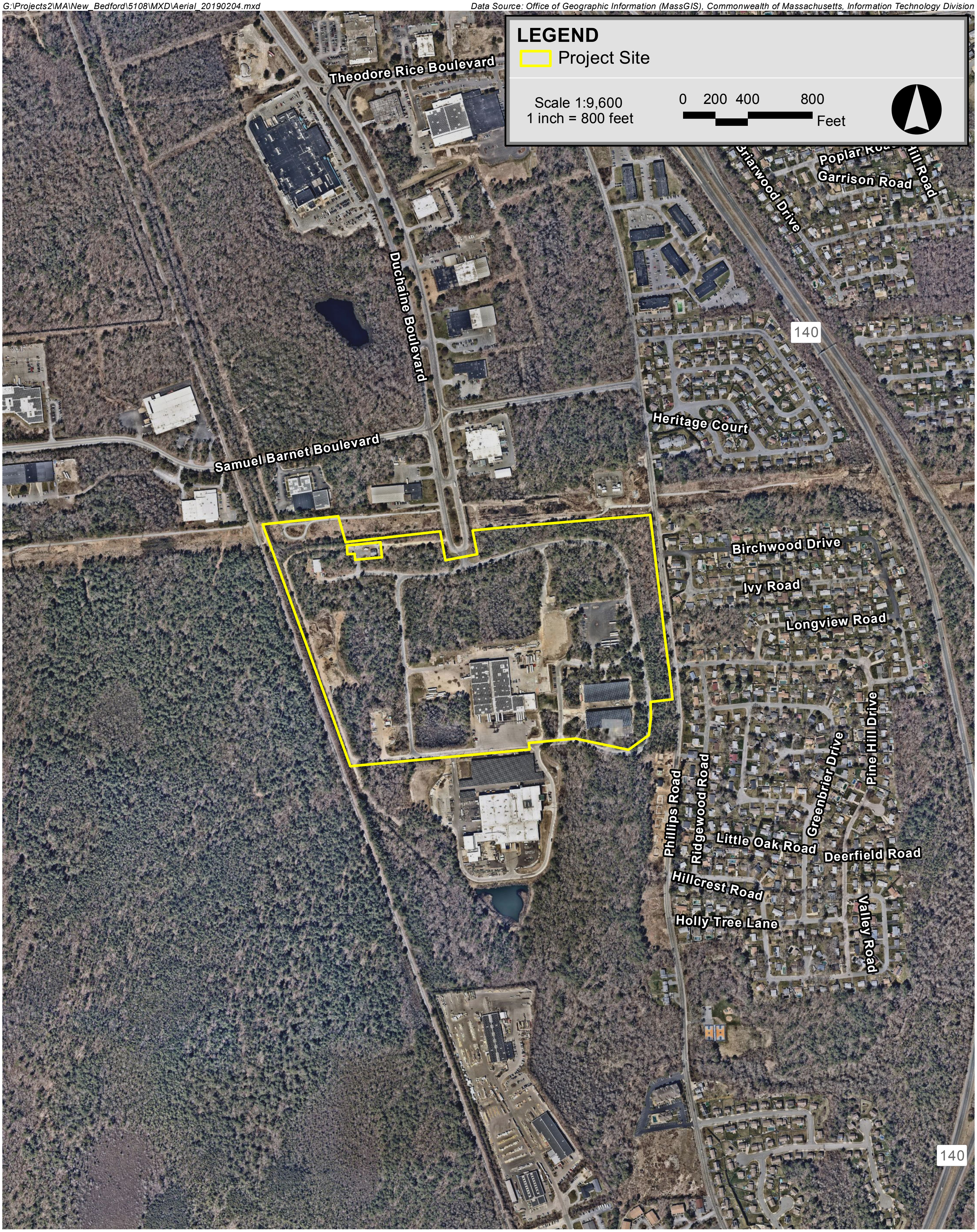
Data Source: Office of Geographic Information (MassGIS), Commonwealth of Massachusetts, Information Technology Division

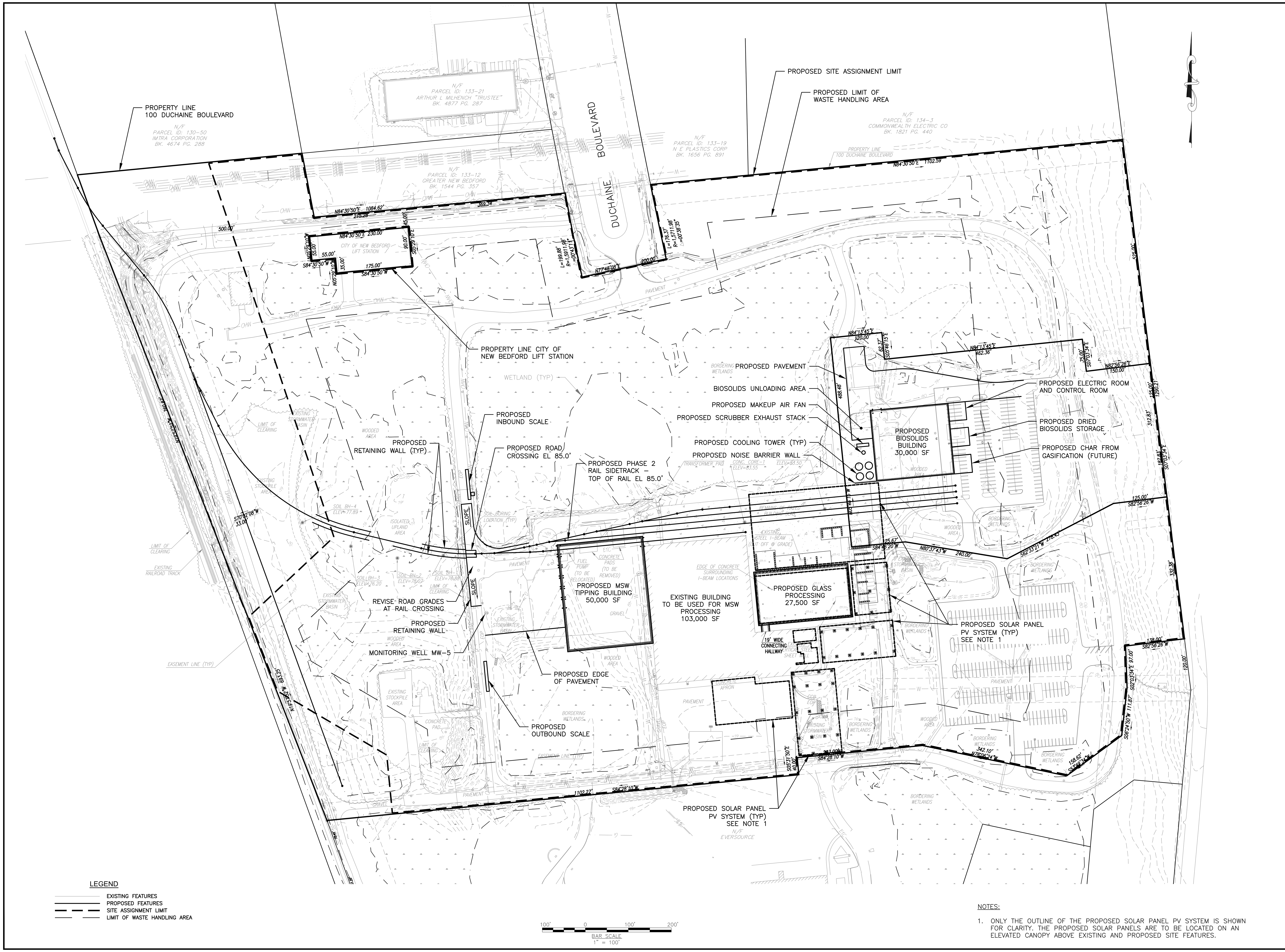



**Parallel Products** **New Bedford, Massachusetts**

Epsilon
ASSOCIATES INC.

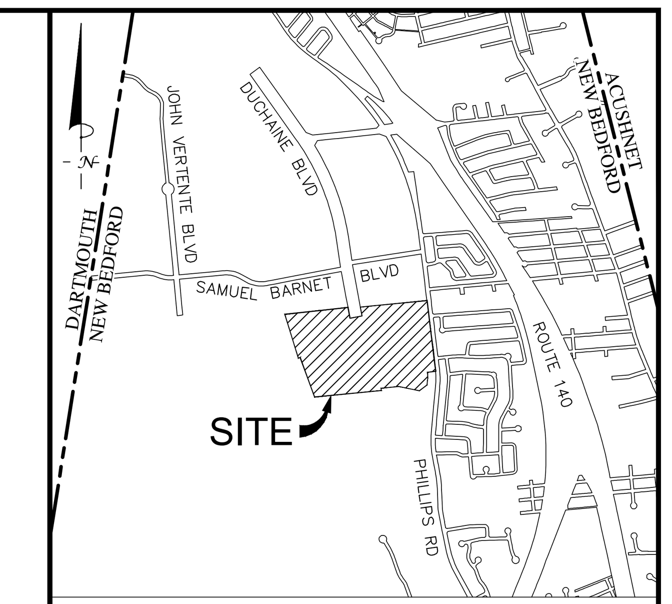
**Figure 1**

*Aerial Locus Map*




NOTES:

1. ONLY THE OUTLINE OF THE PROPOSED SOLAR PANEL PV SYSTEM IS SHOWN FOR CLARITY. THE PROPOSED SOLAR PANELS ARE TO BE LOCATED ON AN ELEVATED CANOPY ABOVE EXISTING AND PROPOSED SITE FEATURES.




LOCUS MAP NOT TO SCALE

Green Seal Environmental, Inc.
114 State Road, Building B
Sagamore Beach, MA 02562
Tel: (508) 888-6034
Fax: (508) 888-1506
www.gseenv.com



REVISIONS

| NO. | DATE | COMMENT |
|---|---|---|
| A | 2/4/2019 | ISSUED FOR PERMITTING |

PURPOSE:

PERMITTING

LOCUS:

100 DUCHAINE BOULEVARD
NEW BEDFORD,
MASSACHUSETTS

PREPARED FOR:

PARALLEL PRODUCTS, LLC

DRAWING TITLE:

PHASE 2 SITE PLAN

| CAD TECH: | CHECKED BY: |
|---|---|
| T. JANICKI | |
| ENGINEER: | DATE: |
| W. HALL | 2/1/2019 |

SCALE:

1"=100'

SHEET:

C-2A

**Figure 2**
**Conceptual Layout / Phase 2 Site Plan**
**(Green Seal Environmental, Inc.)**

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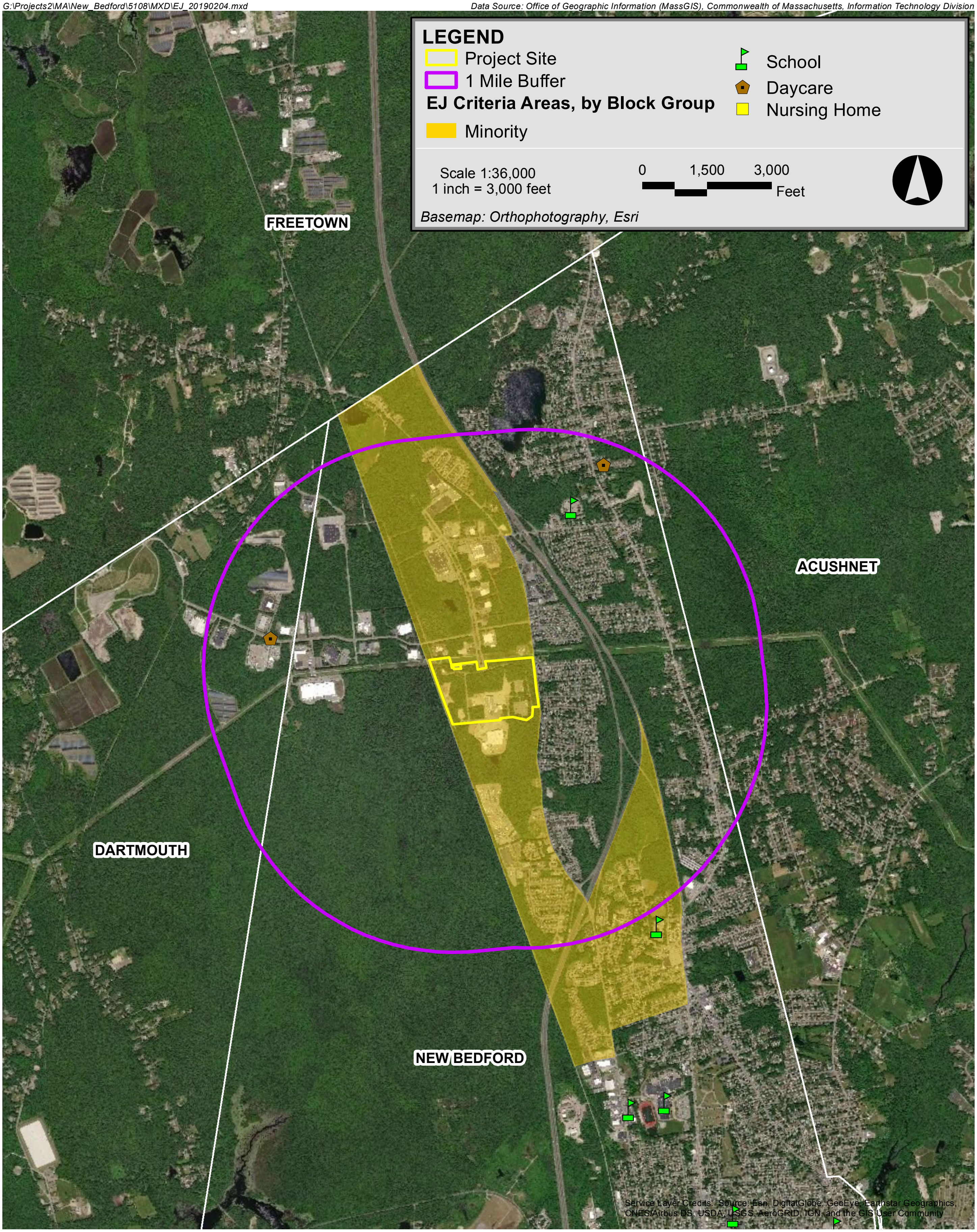
Data Source: Office of Geographic Information (MassGIS), Commonwealth of Massachusetts, Information Technology Division




**Parallel Products** **New Bedford, Massachusetts**

Epsilon ASSOCIATES INC.

**Figure 3**

*Environmental Justice Areas Criteria by Block Group*

ATTACHMENT 16

GREENHOUSE GAS

Massachusetts Environmental Policy Act
*Greenhouse Gas Analysis*

# Parallel Products of New England
## New Bedford, Massachusetts

*Submitted to:*
PARALLEL PRODUCTS OF NEW ENGLAND, INC.
100 Duchaine Boulevard
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*Submitted by:*
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**September 20, 2019**

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# GREENHOUSE GAS (GHG) ANALYSIS

An initial GHG analysis was presented in the EENF. This analysis addressed the GHG emissions that would be generated by operation of the Project and associated traffic, and options that may reduce those emissions in accordance with the MEPA GHG Policy. The GHG analysis focused on emissions of carbon dioxide ($CO_2$). As noted in the GHG Policy, although there are other GHGs, $CO_2$ is the predominant contributor to global warming. Furthermore, $CO_2$ is by far the predominant GHG emitted from the types of sources related to this Project, and $CO_2$ emissions can be calculated for these source types with readily available data.

GHG emissions sources can be categorized into two groups: (1) stationary sources, or emissions related to structures and equipment that are stationary on the site; and (2) mobile sources, or emissions related to transportation. Stationary sources can be further broken down into direct sources and indirect sources; direct sources include GHG emissions from on-site fuel combustion, and indirect sources include GHG emissions associated with electricity and other forms of energy that are imported from off-site power plants via the regional electrical grid for use on-site.

The GHG analysis presented in the EENF detailed building energy modeling for the planned Project. The ENF Certificate included comments from the Department of Energy Resources (DOER). As the building designs have advanced somewhat since the filing of the EENF, design decisions have been informed through careful modeling and cost analysis. In this continuation of the GHG analysis, Project details are updated, and DOER and MEPA comments are addressed.

## 1.0 Project Update

As detailed in the EENF, the proposed overall project includes a solar PV initiative and is a combination of three industrial processes: recycled glass handling, municipal solid waste (MSW) processing and construction and demolition (C&D) handling, and biosolids processing. The project will be implemented in sequential phases. The glass handling is being implemented as Phase 1, the MSW processing will be implemented as Phase 2, and biosolids processing will be implemented as Phase 3.

Since the submittal of the EENF, the glass handling building design has been added as a conditioned space. Like the biosolids building, the glass handling building will be minimally heated in the winter to maintain 50 degrees Fahrenheit. The glass handling building received a Phase 1 waver and is under construction.

Additionally, mobile source emissions have been updated to reflect operational changes that have been determined.

## 2.0 DOER Comments

The majority of the DEIR scope centers on the comments and recommendation made by DOER in their comment letter on the EENF. They are:

- Clarification of the planned code pathway;

- Building construction of biosolids building;
- Envelope information for both roof and walls of biosolids building;
- Space heating output per area for biosolids building;
- Evaluation of reduced lighting power density to 20%;
- Evaluation of using cold-climate heat pumps for space heating; and
- Schedule for installation of solar PV system.

### *2.1 Clarification of the Planned Code Pathway*

The planned code pathway was clarified and presented in a memorandum to DOER from WSP on August 29, 2019, included in the GHG Appendix. The key points of the clarifications in that memo are discussed below.

Three buildings will be heated and are considered "conditioned spaces". They are:

- The Glass Processing Building, Glass Processing Section
- The Glass Processing Building, Bunker Building Section
- Bio-solids Building

The Project will follow ASHRAE 90.1-2013 with Massachusetts Amendments per Chapter 13 of 780 CMR code compliant pathway. As such, the project will comply with the mandatory and prescriptive requirements of ASHRAE 90.1-2013 and all conditioned buildings will comply with two of the six C406.1 measures. These two measures are reduced lighting power density by a minimum of 10% and the use of on-site renewable energy supply in the form of an approximately 1.9 MW photovoltaic (PV) array installed on adjacent canopies within the site. Because of their size, the buildings are not subject to stretch code.

The conditioned buildings will meet the mandatory and prescriptive requirements of the energy code. These three buildings will comply with Sections 5.1, 5.4, 5.8, as well as Section 5.5 – Prescriptive Building Envelope Option (which is allowed when fenestration area does not exceed the maximum allowed by Section 5.5.4.2.").

Note that roof of the Glass Handling Building (under construction) is designed with the R=19 insulation but without the R=11 liner system prescribed by ASHRAE 90.1-2013. PPNE is evaluating final design options; the FEIR will commit to retrofit of the R=11 liner system or will provide documentation that the additional heating energy consumption (and incremental GHG impact) due to the code deviation does not warrant the retrofit.

Otherwise, these buildings will have insulation that meets the requirements of Sections 5.8.1.1 through 5.8.1.10. The conditioned spaces will meet the Section 5.4.3.1 requirements for a continuous air barrier.

### *2.2 Conditioned Building Information*

#### 2.2.1 Glass Handling Building

The glass handling building (glass processing and bunker sections) will be a pre-engineered metal building with an eave height of 24'-0" and a peak height of 50'-0". The use is for the processing and sorting glass products for recycling. The exterior sides of the building will be 26 gage corrugated metal panel. The roof panels are standard "Double-Lok" metal roof panels. The envelope will be designed with R=19 roof and wall insulation (and the roof insulation design is under review).

The expected space heating output per area for the glass handling building is expected to be approximately 15 to 16 Btu/hr/sf.

#### 2.2.2 Biosolids Building

The biosolids building will be a pre-engineered metal building with a roof low point of 52'-3" and a high point of 57'-2". The use is for processing bio-solids. The base of the exterior walls of the building will have 15' of exposed concrete with added inboard insulation to reach R-19 below 26 gage corrugated metal panel. The roof panels are standard "Double-Lok" metal roof panels. There will be a small office & restroom in the building. The Bio-Solids building will have roof insulation of R=19 + R=11 Ls (linear system) & R=19 wall insulation.

The space heating output per area for the biosolids building is expected to be approximately 144 Btu/hr/sf.

### *2.3 Reduced Lighting Power Density Evaluation*

LED lighting will be employed throughout the project. After careful consideration, the lighting power density of the Project buildings can be reduced to at least 20% below code. Please refer to the GHG Appendix for a preliminary lighting calculation.

### *2.4 Cold-Climate Heat Pump Evaluation for Space Heating*

Heat Pumps were evaluated as an alternative system to the proposed design of gas heating. Please refer to the GHG Appendix for a detailed heat pump analysis performed by WSP.

The analysis indicates that a heat pump system could reduce building GHG emissions by approximately 39% to 42%. This reduction is significant and warranted a detailed cost analysis. The cost analysis indicated that the incremental first cost minus MassSave incentives ranged between $23,800 to $255,600. In all cases, the heat pump systems cost more to operate, from $4,600 to $48,700 annually. The results of this analysis are summarized in Tables 1 through 3, below.

**Table 1 Annual Heating Energy Consumption Comparison, Glass Processing**

| Glass Processing Building | GHG Savings (%) | Incremental first cost minus MassSave Incentives ($) | Incremental operating cost savings minus State AEC Incentives ($) | Simple Payback Period (years) |
|---|---|---|---|---|
| Baseline – Gas Heating 80% Efficient | - | - | - | - |
| Proposed Design – Gas Heating 82% Efficient | 2.2% | 718 | 187 | 3.8% |
| Proposed Alternative – Heat Pump Heating: | 39.4% | 23,818 | -4,602 | Does not pay back |

**Table 2 Annual Heating Energy Consumption Comparison, Glass Processing Bunker Building**

| Glass Processing Building | GHG Savings (%) | Incremental first cost minus MassSave Incentives ($) | Incremental operating cost savings minus State AEC Incentives ($) | Simple Payback Period (years) |
|---|---|---|---|---|
| Baseline – Gas Heating 80% Efficient | - | - | - | - |
| Proposed Design – Gas Heating 82% Efficient | 2.2% | 654 | 170 | 3.8% |
| Proposed Alternative – Heat Pump Heating: | 39.4% | 23,938 | -4,192 | Does not pay back |

**Table 3 Annual Heating Energy Consumption Comparison, Biosolids Building**

| Glass Processing Building | GHG Savings (%) | Incremental first cost minus MassSave Incentives ($) | Incremental operating cost savings minus State AEC Incentives ($) | Simple Payback Period (years) |
|---|---|---|---|---|
| Baseline – Gas Heating 80% Efficient | - | - | - | - |
| Proposed Design – Gas Heating 82% Efficient | 2.4% | 7,610 | 1,980 | 3.8% |
| Proposed Alternative – Heat Pump Heating: | 42.7% | 255,653 | -48,760 | Does not pay back |

As demonstrated in the tables above, the heat pump systems would reduce building GHG emissions, however they would also increase both first costs and operating costs. For this reason, the use of heat pumps is financially infeasible to the project.

### *2.5 Solar PV Installation Schedule*

The Proponent anticipates receiving the Order of Conditions for the canopy PV construction in September, 2019. Construction will begin following receipt of order of conditions. Construction will continue until completion, with a January 1st 2020 target completion date.

## 3.0 MEPA Comments

### *3.1 VFDs and Advanced Vacuum Technology*

The Proponent will incorporate variable frequency drives (VFDs) into the biosolids building ventilation. VFDs allow the building's ventilation system to operate at optimum efficiency, saving energy. The process equipment has not yet been designed. It is anticipated that the process equipment will incorporate VFDs, but process loads are unknown at this time.

Specific biosolids process equipment has yet to be designed. The decision to employ advanced vacuum technology will be made further in the design process, after market conditions have been evaluated.

The addition of advanced (vacuum) drying technology to the biosolids process could further reduce biosolids process natural gas usage by 30%, according to vendor representations. However, PPNE cannot guarantee these savings due to lack of a vendor guarantee and/or supporting data.

## 4.0 GHG Calculations

### *4.1 MSW Building*

As detailed in the EENF, for purposes of this analysis, GHG impacts of the MSW handling process will be limited to the energy use associated with the building. Specifically, the lighting demands for the building will be quantified and the associated GHG emissions will be included in project totals. While VFDs will be incorporated in to the project, their energy reduction impacts are unknown at this time. For that reason, proposed case ventilation demands will not differ from the baseline, so this aspect is not quantified. There will be no heat supplied in the tipping or processing areas. The building will be unconditioned.

Please refer to Table 4 for an estimate of MSW tipping and processing and C&D handling emissions.

**Table 4 Energy Use and GHG Emissions, MSW Tipping and Processing and C&D Handling**

| MSW Tipping and Processing | | | | |
|---|---|---|---|---|
| Building Size | | 87,000 | sf | |
| | | | **Baseline** | **Proposed** |
| DIRECT (NATURAL GAS) | | | MMBtu/yr | MMBtu/yr |
| | Space Heating | | 0 | 0 |
| | | subtotal | 0 | 0 |
| INDIRECT (ELECTRICITY) | | | MWh/yr | MWh/yr |
| | Space Heating | | 0 | 0 |
| | Internal Lighting | | 937 | 750 |
| | | subtotal | 937 | 750 |
| ENERGY USE INDEX | | | kBtu/sf/yr | kBtu/sf/yr |
| | | | 36.7 | 29.4 |
| | (compared to baseline) | | | **-20%** |
| GHG EMISSIONS | | | tons/yr | tons/yr |
| | Direct | Gas-burning | 0 | 0 |
| | Indirect | Electricity | 333 | 266 |
| | | Total | 333 | 266 |
| | | Diff, tpy | | **-66** |
| | Diff, % (compared to baseline) | | | **-20.0%** |
| | $CO_2$ Emission Factors: | | | |
| | Electricity [1] | 710 | lb/MWh | |
| | Natural Gas [2] | 117 | lb/MMBtu | |
| | [1] 2016 ISO New England Electric Generator Air Emissions Report | | | |
| | [2] EIA Fuel Emissions Factors, Weighted National Average (1029 Btu/scf) | | | |

### *4.2 Glass Handling Building*

As detailed in the EENF, The GHG impacts of the biosolids processing facility have been quantified and the process energy loads have been estimated. This process is industry standard and does not have a GHG reduction associated with it. Therefore, GHG reduction opportunities will be limited to the energy use associated with the building. Specifically, the lighting, ventilation, and heating demands for the building have been quantified and the associated GHG emissions reductions have been included in project totals. Please refer to the GHG Appendix for lighting and heating demand calculations.

Please refer to Table 5 for an estimate of glass handling emissions.

**Table 5 Energy Use and GHG Emissions, Glass Processing and Bunker Building Combined**

| Glass Handling (Processing and Bunker) | | | | |
|---|---|---|---|---|
| | | | | |
| Glass Processing | | 27,500 | sf | |
| Bunker Building | | 23,320 | sf | |
| Total | | 50,820 | sf | |
| | | | | |
| | | | **Baseline** | **Proposed** |
| DIRECT (NATURAL GAS) | | | MMBtu/yr | MMBtu/yr |
| | Space Heating | | 1,220 | 1,191 |
| | | subtotal | 1,220 | 1,191 |
| | | | | |
| INDIRECT (ELECTRICITY) | | | MWh/yr | MWh/yr |
| | Space Heating | | 20 | 20 |
| | Internal Lighting | | 765 | 612 |
| | | subtotal | 785 | 632 |
| | | | | |
| ENERGY USE INDEX | | | kBtu/sf/yr | kBtu/sf/yr |
| | | | 76.7 | 65.8 |
| | (compared to baseline) | | | **-14%** |
| | | | | |
| GHG EMISSIONS | | | tons/yr | tons/yr |
| | Direct | Gas-burning | 71 | 70 |
| | Indirect | Electricity | 268 | 215 |
| | | Total | 339 | 285 |
| | | Diff, tpy | | **-54** |
| | Diff, % (compared to baseline) | | | **-15.9%** |
| | $CO_2$ Emission Factors: | | | |
| | Electricity [1] | 682 | lb/MWh | |
| | Natural Gas [2] | 117 | lb/MMBtu | |
| | | | | |
| | | | | |
| | [1] 2017 ISO New England Electric Generator Air Emissions Report | | | |
| | [2] EIA Fuel Emissions Factors, Weighted National Average (1029 Btu/scf) | | | |

### *4.3 Biosolids Building*

As detailed in the EENF, The GHG impacts of the biosolids processing facility have been quantified and the process energy loads have been estimated. This process is industry standard and does not have a GHG reduction associated with it. Therefore, GHG reduction opportunities will be limited to the energy use associated with the building. Specifically, the lighting, ventilation, and heating demands for the building have been quantified and the associated GHG emissions reductions have been included in project totals. Please refer to the GHG Appendix for lighting and heating demand calculations.

Please refer to Table 6 for an estimate of biosolids processing emissions.

**Table 6 Energy Use and GHG Emissions, Biosolids Building**

| Biosolids Processing | | | | |
|---|---|---|---|---|
| Building Size | | 30,000 | sf | |
| | | | **Baseline** | **Proposed** |
| DIRECT (NATURAL GAS) | | | MMBtu/yr | MMBtu/yr |
| | Dryer Heating Load | | 136,365 | 136,365 |
| | Space Heating | | 6,766 | 6,601 |
| | | subtotal | 143,131 | 142,966 |
| INDIRECT (ELECTRICITY) | | | MWh/yr | MWh/yr |
| | Process Electricity | | 4,844 | 4,844 |
| | Ventilation | | 1,435 | 1,435 |
| | Space Heating | | 14 | 14 |
| | Internal Lighting | | 323 | 259 |
| | | subtotal | 6,616 | 6,552 |
| ENERGY USE INDEX | | | kBtu/sf/yr | kBtu/sf/yr |
| | | | 5,524 | 5,511 |
| | (compared to baseline) | | | **0%** |
| GHG EMISSIONS | | | tons/yr | tons/yr |
| | Direct | Gas-burning | 8,373 | 8,364 |
| | Indirect | Electricity | 2,349 | 2,326 |
| | | Total | 10,722 | 10,690 |
| | | Diff, tpy | | **-32** |
| | Diff, % (compared to baseline) | | | **-0.3%** |
| | $CO_2$ Emission Factors: | | | |
| | Electricity [1] | 710 | lb/MWh | |
| | Natural Gas [2] | 117 | lb/MMBtu | |
| | [1] 2016 ISO New England Electric Generator Air Emissions Report | | | |
| | [2] EIA Fuel Emissions Factors, Weighted National Average (1029 Btu/scf) | | | |

## 5.0 Mobile Source Update

### *5.1 Mobile Source emissions revisions*

Several changes have been made to the mobile source emission calculation following the EENF. Initially, vehicle emissions while in motion assumed 90% of site traffic would travel 3.0 miles round-trip north to Route 140 via Theodore Rice Boulevard and Braley Road while the other 10% would travel 4.5 miles round-trip south to Route 140 via Samuel Barnet Boulevard and Phillips Road. It has been clarified that all truck traffic will go north via Theodore Rice Boulevard and Braley Road.

Front end loader rates have been adjusted slightly to reflect operational refinement. Additionally, a load factor from the EPA has been included. The revised mobile source emissions summary is detailed in Table 7.

**Table 7 Mobile Source GHG Emissions Analysis Summary**

| Pollutant | $CO_2e$ (lbs/day) | $CO_2e$ (tons/yr) |
|---|---|---|
| Front-End Loader Emissions | 2804 | 512 |
| Truck-Generated Emissions | 6307 | 1150 |
| Employee Vehicle-Generated Emissions | 324 | 59 |
| **Total** | **9,435** | **1721** |

### *5.2 Rail versus Truck Comparison*

The project is expected to reduce GHG by using freight rail to haul residuals from the processing of MSW, C&D waste, dried biosolids, and glass to various facilities in the Eastern and Midwestern United States. The MSW residuals, C&D waste, and dried biosolids will be moved by rail to landfills in Ohio (New Lexington or Fostoria locations). Alternative trucked locations for these wastes include the same landfills in Ohio and nearer landfills in New York State and New Hampshire. The processed glass materials will be sent to one or more of the following three locations: Henderson, North Carolina, Winchester, Indiana, and Toano, Virginia.

As requested by MEPA, the following analysis compares rail versus trucking using the most common landfill for the wastes and the closest destination for the glass. This analysis is based on the assumption that the wastes destination will be New Lexington, Ohio and the glass destination will be Toano, Virginia.

#### 5.2.1 Trucks

Emissions from on-road long haul trucks were calculated using the U.S. EPA's Motor Vehicle Emissions Simulator (MOVES2014b). The vehicle mix was set to output emission factors for vehicle "type 62" which corresponds to "combination long-haul trucks". Emission factors for "rural restricted" roadways at speeds from 0 mph to 80 mph were requested. "Rural restricted" roads are the best classification resembling the majority of the highway roads along the selected routes. Other MOVES inputs (age distribution, inspection and maintenance program information, etc.) were obtained from the MassDEP for Bristol County year 2025. It was assumed that trucks have local registrations are subject to local motor vehicle regulations.

Moving vehicle emissions were calculated by multiplying the number of daily trucks by the route distance (in miles) and the 65 mph emission factor (in grams per vehicle-mile traveled) to get mass emissions per day from moving vehicles.

For idling emissions from these trucks, it was estimated that the trips from New Bedford to Virginia and Ohio would take roughly 10 to 12 hours, respectively. Since the trip times exceeded 8 hours, a mandatory 30 minute break for the driver was required. It was also assumed that 5% of the entire travel time was spent idling for various reasons (traffic, tolls, refueling, etc). Idling emissions were calculated by multiplying the number of daily trucks by the estimated idling time (in hours) and the 0 mph emission factor (in grams per hour) to get mass emissions per day from idling vehicles.

For MSW/C&D/Biosolids that are hauled by truck from the New Bedford area to Tunnel Hill in New Lexington, Ohio, the truck trip is roughly 723 miles and the time spent idling is estimated at just over an hour. It is estimated that 58 trucks per day will take this haul route. This translates to about 154,426 lb/day of $CO_2e$ or 28,183 tpy (assuming 365 days of operation).

For glass that is hauled by truck from New Bedford to Toano, Virgina, the truck trip is roughly 584 miles and the time spent idling is estimated at an hour. It is estimated that 9 trucks per day will take this haul route. This translates to about 19,289 lb/day of $CO_2e$ or 3,520 tpy (assuming 365 days of operation).

### 5.2.2 Rail

Emissions from rail haul were calculated using emission factors provided by U.S. EPA.[1] emission factors for "large line haul" and "large switch" for 2025 in grams per gallon of fuel used. A diesel fuel density of 3255.45 g/gallon (860 kg/m3 at 15°C) and a carbon content of 87% by mass were used to obtain the $CO_2$ emissions from locomotives.

Since the amount of fuel used per haul trip was unavailable, the g/gal emission factors were converted to g/ton-mile factors using the suggested value of moving 400 tons of freight one mile consumes 1 gallon of fuel. Thus, dividing g/gal emission rates by 400 ton-miles/gal gives approximate g/ton-mile emission rates.

1 U.S. EPA, Emission Factors for Locomotives, EPA-420-F-09-025, April 2009.

For the rail haul, it was assumed that during the entire trip, the locomotive spent 92.6% of the time in "haul mode" and the remaining 7.4% of the time in "switch" mode, based on fuel consumption by service category data provided by U.S. EPA.

Rail haul emissions were calculated by multiplying the daily tons of freight hauled by the route mileage (haul or switching) and by the appropriate emission factor (in g/ton-mile). For MSW/C&D/Biosolids that are hauled by rail from the New Bedford area to Tunnel Hill in New Lexington, Ohio, the rail trip is roughly 850 miles. Given the haul/switch breakdown and the estimated 1300 tons per day of waste, it is estimated that about 63,247 lb/day of CO2e or 11,543 tpy (assuming 365 days of operation) is generated.

For glass that is hauled by rail from the New Bedford area to Toano, Virginia, the rail trip is roughly 650 miles. Given the haul/switch breakdown and the estimated 200 tons per day of waste, it is estimated that about 7,441 lb/day of CO2e or 1,358 tpy (assuming 365 days of operation) is generated.

### 5.2.3 Comparison Results

Overall, transport via rail results in a reduction of approximately 60% of GHG versus using on-road long haul trucks. A summary of the results is shown in Table 8.

**Table 8 GHG Comparison of Rail Haul vs. On road Haul**

| | MSW/Biosolids | | Glass | |
|---|---|---|---|---|
| | Truck | Rail | Truck | Rail |
| GHG (lb/day) | 154,426 | 63,247 | 19,289 | 7,441 |
| GHG (tpy) | 28,183 | 11,543 | 3,520 | 1,358 |
| Difference (tpy) | - | -16,640 | - | -2,162 |
| Difference (%) | - | -59% | - | -61% |

## 6.0 Summary and Mitigation Commitments

### *6.1 Project GHG Summary*

Table 9 below presents a composite of project GHG emissions profiles of the Baseline and Proposed cases.

**Table 9 Project GHG Emissions Summary**

| | Project GHG Emissions Summary | | | |
|---|---|---|---|---|
| | Baseline | Proposed | Difference | |
| | tons/yr | | | % |
| Glass Handling | 339 | 285 | 54 | -15.9 |
| MSW | 333 | 266 | 66 | -20.0 |
| Biosolids | 10,722 | 10,690 | 32 | -0.3 |
| Mobile Sources | 1,721 | 1,721 | - | - |
| On-site renewable energy | | -1,649 | | |

### *6.2 Proponent's Commitments to GHG Reduction*

PPNE has detailed their commitments to mitigate project GHG emissions. Additional mitigation measures have not been quantified, primarily because the degree of accuracy or the reliability of the quantification method is uncertain.

PPNE is committed to environmental stewardship. As design develops further, the company expects that additional technologies described previously, or possibly new technologies developed in the interim period, may be adopted that will further decrease GHG emissions, but these are not yet ripe for selection. The proponent will encourage the continued evaluation of energy efficiency and renewable energy measures throughout the life of the project.

PPNE is committed to the following mitigation elements for the project:

- The installation of 1.9 MW of canopy solar PV to increase the site's overall PV capacity to 3.5 MW.
- A 20% reduction over Code in lighting installations electricity use in the new buildings (glass handling, MSW tipping, and biosolids processing) and in the MSW processing area of the existing building
- High-efficiency mechanical equipment;
- VFDs where appropriate;
- High-performance building envelopes;
- PV-Ready new construction;
- Construction waste recycling.

The proponent has included in the design of the project, all feasible GHG emissions mitigation to avoid, reduce, minimize, or mitigate damage to the environment.

The proponent is committed to implementing the energy efficiency and GHG emission reduction measures presented in this analysis but must retain an amount of design flexibility to allow for changes that will inevitably occur as design progresses. If, during project design, a specific combination of design strategies proves more advantageous from an engineering, economic, or space utilization perspective, the design of the project may vary from what has been described herein. Energy performance minima and associated GHG emission reductions will be adhered to.

Upon completion of the project, PPNE will submit a self-certification to the MEPA Office, prepared in accordance with the GHG Policy. This certification will identify the GHG mitigation measures incorporated into the project and will illustrate the degree of GHG reductions from a baseline case, as baseline is defined herein, and how such reductions are achieved.

# Greenhouse Gas Appendix

MEMORANDUM

**TO:** Massachusetts Dept. of Energy Resources

**FROM:** WSP

**SUBJECT:** **Parallel Products / New Bedford, MA – Energy Compliance Path**

**DATE:** **August 9, 2019**

---

**The following identifies our proposed code compliant pathway & its requirements:**

The engineering team has proposed to follow the following code compliant path:

- ASHRAE 90.1-2013 with Massachusetts Amendments per Chapter 13 of 780 CMR

The project will comply with the mandatory and prescriptive requirements of ASHRAE 90.1-2013. In addition, all conditioned buildings will comply with two of the six C406.1 measures as follows:

- Reduced lighting power density in accordance with Section C406.3
    - All buildings will achieve minimum 10% lighting power density reduction.
- On-site supply of renewable energy in accordance with Section C406.4
    - Approximately 1.9-MW of photovoltaic array will be installed on adjacent canopies within the site.

**Project Summary:**

The project consists of the construction of 7 different structures on the site:

1. Glass Building (for processing glass recyclables), which has 3 separate components:
    a. Glass Processing Section – a conditioned space per ASHRAE due to the heating load calculations (19 Btu/hr./s.f.). Mechanical systems to maintain space at approximately 50 degrees F.
    b. Bunker Building Section – a conditioned space per ASHRAE due to the anticipated heating load.Mechanical systems to maintain space at approximately 50 degrees F.
    c. Rear Photovoltaic Canopy #2 – an open-sided roof extension above rail tracks.
2. Side Bunker Building – an unconditioned space.
3. Rear Photovoltaic Canopy #1 – an open-sided, trellis type structure for PV panels.
4. Front Photovoltaic Canopy #1 – an open-sided roofed shed above loading dock approaches for PV panel installation.
5. Front Photovoltaic Canopy #2 – an open-sided, trellis type structure for PV panel installation.

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6. Municipal Solid Waste Addition – an unconditioned space.
7. Bio-Solids Building – a conditioned space per ASHRAE due to the anticipated heating load. Processing floor to be maintained at 50 degrees F and approximately 1,500 sf of office/restroom suite to be maintained at approximately 70 degrees F with both heat & A/C.

Following are the requirements of this selected Code Compliant Path for Climate Zone 5A for the various elements of the project required to be energy code compliant:

**Section 5 – Building Envelope:**

The following (3) conditioned buildings will meet the mandatory and prescriptive requirements of the energy code:

1a: Glass Processing Section

1b: Bunker Building Section

7: Bio-solids Building

**5.2 – Compliance Paths**

5.2.1 – Compliance to be per Section 5.1, Section 5.4, Section 5.7, Section 5.8 and Section 5.5 – Prescriptive Building Envelope Option (as allowed since "fenestration area does not exceed the maximum allowed by Section 5.5.4.2." – which is meet per the proposed design.

**5.4 – Mandatory Provisions**

5.4.1 – Insulation / As prescribed & applicable, the buildings shall comply with the insulation requirements of Sections 5.8.1.1 through 5.8.1.10.

5.4.3.1 – Continuous Air Barrier / Only the conditioned space of the Glass Building will be required to comply with Section 5.4.3.1, all other buildings are unconditioned.

**5.5 – Prescriptive Building Envelope Option**

5.5.2 – As applicable, buildings will comply with the requirements for conditioned space in Table 5.5-5.

**Table 5.5-5 – Building Envelope Requirements for Climate Zone 5 (A, B, & C):**

Roofs

Metal Building R-19 + R-11 Ls (U-0.037)

Walls, Above Grade

Metal Building R-0 + R-19 c.i. (U-0.050)

Slab on Grade / Unheated

R-15 for 24 in. (F-0.52)

Opaque Doors

Swinging U-0.500

Nonswinging U-0.500

Vertical Fenestration

| | |
|---|---|
| Metal Framing, Fixed | U-0.42 |
| Metal Framing, Operable | U-0.50 |
| Metal Framing, Ent. Door | U-0.77 |

Notes: "c.i."=Continuous Insulation / Ls = Linear System / NR = No (Insulation) Required.

**Sections 6 through 9 – HVAC, Service Water Heating, Electrical Power and Lighting**

The (3) conditioned buildings will meet the mandatory and prescriptive requirements of these sections, as applicable.

Mechanical:

The conditioned buildings will be heated by gas-fired heating and ventilating units to maintain 50 degrees F within the space. These heaters will have a minimum efficiency of 82%.

Within the Bio-solids building there will be 1,500 sf of office/restroom suite to be maintained at approximately 70 degrees F with gas-fired heating and air-cooled DX cooling.

Lighting:

Lighting power density will be reduced by at least 10% from ASHRAE 90.1-2013 to comply with Section C406.1 of the MA Energy Code.

-END-

**New Lighting Requirements and Reduction**

**I. Estimate New Lighting Requirements**

**A. Glass Handling, Low Bay (<25' floor to ceiling height)**

| | | |
|---|---|---|
| Proposed glass processing building | 27,500 | SF |
| Proposed Glass Bunker Building | 23,320 | SF |
| Proposed Side Bunker Buildings | 22,592 | SF |
| TOTAL Glass Handling Low Bay Area | 73,412 | SF |
| Low Bay Lighting Density | 1.19 | W/SF |
| Low Bay Lighting Requirement | 87,360 | W |
| | 8,760 | annual operating hours |
| | 765 | **MWh/yr baseline** |
| | 153 | **MWh/yr 20% reduction commitment** |
| | 612 | **MWh/yr proposed** |

**B. MSW and Tipping Buildings, High Bay (25' - 50' floor to ceiling height)**

| | | |
|---|---|---|
| Existing building | 103,000 | SF* |
| Less non-MSW-processing in existing building will use existing lighting | -66,000 | SF* |
| Proposed MSW tipping building | 50,000 | SF |
| TOTAL MSW and Tipping High Bay Area | 87,000 | SF |
| High Bay Lighting Density | 1.23 | W/SF |
| High Bay Lighting Requirement | 107,010 | W |
| | 8,760 | annual operating hours |
| | 937 | **MWh/yr baseline** |
| | 187 | **MWh/yr 20% reduction commitment** |
| | 750 | **MWh/yr proposed** |

**C. Biosolids Buildings, High Bay (25' - 50' floor to ceiling height)**

| | | |
|---|---|---|
| TOTAL Biosolids High Bay Area | 30,000 | SF |
| High Bay Lighting Density | 1.23 | W/SF |
| High Bay Lighting Requirement | 36,900 | W |
| | 8,760 | annual operating hours |
| | 323 | **MWh/yr baseline** |
| | 65 | **MWh/yr 20% reduction commitment** |
| | 259 | **MWh/yr proposed** |

# HEAT PUMP ANALYSIS

**TO:** Massachusetts Dept. of Energy Resources

**FROM:** WSP

**SUBJECT:** **Parallel Products / New Bedford, MA – Heat Pump Analysis DRAFT**

**DATE:** **August 23, 2019**

## Project Overview

The purpose of this analysis is to evaluate gas and electric heating systems at Parallel Product's new proposed recycling facility located in New Bedford, MA. The project will consist of multiple structures, including (3) conditioned buildings as follows:

1. Glass Processing Building, Glass Processing Section (27,200 SF) – a conditioned space per ASHRAE due to the anticipated heating load calculations (15 Btu/hr/sf). Mechanical systems to maintain space at approximately 50 degrees F.
   - Estimated Heating Load – 410,000 Btu/hr
2. Glass Processing Building, Bunker Building Section (23,320 SF) – a conditioned space per ASHRAE due to the anticipated heating load (16 Btu/hr/sf). Mechanical systems to maintain space at approximately 50 degrees F.
   - Estimated Heating Load – 375,000 Btu/hr
3. Bio-Solids Building (30,000 SF) – a conditioned space per ASHRAE due to the anticipated heating load (144 Btu/hr/sf). Processing floor to be maintained at 50 degrees F and approximately 1,500 sf of office/restroom suite to be maintained at approximately 70 degrees F with both heat & A/C.
   - Estimated Heating Load – 425,000 Btu/hr for space heating, 3,900,000 Btu/hr process ventilation

## HVAC System Options

The code-compliant baseline heating system is assumed to be an 80% efficient gas-fired packaged heating unit. This unit will heat the space to 50°F in the winter and will also provide minimum code-required ventilation year-round. No cooling will be provided to the space, except for a small 1,500 SF office area within the Bio-solids building. The proposed design options are as follows

- Proposed Design = Gas-fired Furnace Heating and Ventilating Unit with 82% Efficiency
- Proposed Alternate Design = Electric Packaged Heat Pump Unit with 3.4 COP at 47°F OA

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## Heating Energy Analysis

For each option, WSP estimated the annual energy consumption, greenhouse gas (GHG) emissions, and energy cost using spreadsheet calculations based on weather bin data. The results of this analysis are shown in the tables below:

**Table 1: Annual Heating Energy Consumption**

| Glass Processing Building | Annual Energy Consumption | | | | GHG Emissons | | Annual Energy Cost | |
|---|---|---|---|---|---|---|---|---|
| | Electricity (kWh) | Natural Gas (therm) | Total Energy (MMBtu) | Energy Savings (%) | GHG Emissions (tons/year) | GHG Savings (%) | Energy Cost ($) | Energy Cost Savings ($) |
| **Baseline - Gas Heating 80% Efficient:** | 10,261 | 6,387 | 674 | - | 41 | - | $9,922 | - |
| **Proposed Design - Gas Heating 82% Efficient:** | 10,261 | 6,231 | 658 | 2.3% | 40 | 2.2% | $9,735 | $187 |
| **Proposed Alternative - Heat Pump Heating:** | 70,018 | 0 | 239 | 64.5% | 25 | 39.4% | $15,404 | -$5,482 |

| Glass Bunker Building | Annual Energy Consumption | | | | GHG Emissons | | Annual Energy Cost | |
|---|---|---|---|---|---|---|---|---|
| | Electricity (kWh) | Natural Gas (therm) | Total Energy (MMBtu) | Energy Savings (%) | GHG Emissions (tons/year) | GHG Savings (%) | Energy Cost ($) | Energy Cost Savings ($) |
| **Baseline - Gas Heating 80% Efficient:** | 9,346 | 5,817 | 614 | - | 37 | - | $9,037 | - |
| **Proposed Design - Gas Heating 82% Efficient:** | 9,346 | 5,675 | 599 | 2.3% | 37 | 2.2% | $8,867 | $170 |
| **Proposed Alternative - Heat Pump Heating:** | 63,775 | 0 | 218 | 64.5% | 23 | 39.4% | $14,031 | -$4,994 |

| Bio-solids Building | Annual Energy Consumption | | | | GHG Emissons | | Annual Energy Cost | |
|---|---|---|---|---|---|---|---|---|
| | Electricity (kWh) | Natural Gas (therm) | Total Energy (MMBtu) | Energy Savings (%) | GHG Emissions (tons/year) | GHG Savings (%) | Energy Cost ($) | Energy Cost Savings ($) |
| **Baseline - Gas Heating 80% Efficient:** | 14,096 | 67,664 | 6,814 | - | 401 | - | $84,298 | - |
| **Proposed Design - Gas Heating 82% Efficient:** | 14,096 | 66,014 | 6,649 | 2.4% | 391 | 2.4% | $82,317 | $1,980 |
| **Proposed Alternative - Heat Pump Heating:** | 647,189 | 0 | 2,208 | 67.6% | 230 | 42.7% | $142,382 | -$58,084 |

As shown in the table above, the heat pump system would reduce site energy and GHG emissions; however, it would increase annual energy costs. <u>The heat pump system would cost an additional $16,665 per year to operate compared to the proposed gas furnace heating system.</u>

Utility rates used in the analysis are $0.22/kWh and $1.2/therm.

## Construction Costs

The following construction costs were developed using RS Means:

**Table 2: RS Means Cost Estimates for Air Handling Equipment (Material + Labor)**

| | **RS Means Cost ($/MBH of installed heating capacity)** |
|---|---|
| Gas Rooftop Unit 80% Efficiency ($/MBH Cost) | $70 |
| Gas Rooftop Unit 82% Efficiency ($/MBH Cost) | $72 |
| Rooftop Heat Pump ($/MBH Cost) | $134 |

Using the costs developed above, the heating system costs were calculated for each building based on floor area:

**Table 3: Estimated Air Handling Equipment Cost by Building**

| | **Glass Processing** | **Glass Bunker** | **Bio-Solids** | **TOTAL** |
|---|---|---|---|---|
| Baseline - Gas Heating 82% Efficient: | $28,732 | $26,170 | $304,397 | **$359,298** |
| Proposed Design - Gas Heating 85% Efficient: | $29,450 | $26,824 | $312,007 | **$368,281** |
| Proposed Alternative - Heat Pump Heating: | $55,000 | $50,097 | $582,702 | **$687,800** |
| **Overall Construction Cost Increase for Heat Pump Heating = $319,519** | | | | |

## Alternative Energy Credits and Utility Incentives

Alternative energy certificates (AECs) are financial incentives available to businesses that use air-source heat pump systems, which take advantage of the naturally occurring temperature differences in the air to provide heating/cooling.

Air-source heat pumps with efficiencies that exceed code are also eligible for incentives through the Mass Save Utility Program. For purposes of this analysis the following assumptions were made:

- Project would pursue Mass Save Custom Incentive Approach
- Estimated Incentive is $0.35/kWh saved
- The heat pump system would save 20% energy compared to code, where code would be a code-compliant heat pump, as required.

Table 4 below outlines the potential AECs and incentives available for air-source heat pumps.

**Table 4: AEC and Incentive Summary**

| Incentives Programs Available | Glass Processing | Glass Bunker | Bio-Solids |
|---|---|---|---|
| Alternative Energy Credits for Heat Pump System | $880 | $802 | $9,324 |
| Mass Save Incentives for Heat Pump System | $2,451 | $2,232 | $22,652 |

## Conclusion

Table 5 and 6 below summarize the first cost, incentives, and net operating cost for each building. The proposed gas heating system has a simple payback of 3.8 years, while the heat pump system does not payback. WSP recommends installing 82% efficient gas-fired air handling units for all buildings.

The heat pump system would reduce GHG emissions by 40%, however it would cost an additional $59,892 per year to operate when compared to the proposed gas furnace heating system. It would also increase construction cost by approximately $292,182.

WSP reach out to several vendors that indicated air source heat pump units are currently available in sizes up to ~240,000 Btu/hr. One (1) proposed gas heating make-up air unit for the Bio-solids is currently 47,500 CFM, and ~4,000,000 Btu/hr. This would need to be replaced with (17) air-source heat pumps, which is not a realistic design or approach to heating a high-bay warehouse or manufacturing facility.

**Table 5: Annual First Cost and Operating Cost (By Building)**

| Glass Processing Building | Incentives and Construction Costs | | | | Net First Cost | Net Annual Operating Cost Savings | Simple Payback (years) |
|---|---|---|---|---|---|---|---|
| | Construction Cost ($) | Incremental First Cost ($) | Alt. Energy Credits ($) | Mass Save Incentive* | | | |
| Baseline - Gas Heating 80% Efficient: | $28,732 | $0 | $0 | $0 | - | - | - |
| Proposed Design - Gas Heating 82% Efficient: | $29,450 | $718 | $0 | $0 | $718 | $187 | 3.8 |
| Proposed Alternative - Heat Pump Heating: | $55,000 | $26,269 | $880 | $2,451 | $23,818 | -$4,602 | Does Not Payback |

| Glass Bunker Building | Incentives and Construction Costs | | | | Net First Cost | Net Annual Operating Cost Savings | Simple Payback (years) |
|---|---|---|---|---|---|---|---|
| | Construction Cost ($) | Incremental First Cost ($) | Alt. Energy Credits ($) | Mass Save Incentive* | | | |
| Baseline - Gas Heating 80% Efficient: | $26,170 | $0 | $0 | $0 | - | - | - |
| Proposed Design - Gas Heating 82% Efficient: | $26,824 | $654 | $0 | $0 | $654 | $170 | 3.8 |
| Proposed Alternative - Heat Pump Heating: | $50,097 | $23,927 | $802 | $2,232 | $21,695 | -$4,192 | Does Not Payback |

| Bio-solids Building | Incentives and Construction Costs | | | | Net First Cost | Net Annual Operating Cost Savings | Simple Payback (years) |
|---|---|---|---|---|---|---|---|
| | Construction Cost ($) | Incremental First Cost ($) | Alt. Energy Credits ($) | Mass Save Incentive* | | | |
| Baseline - Gas Heating 80% Efficient: | $304,397 | $0 | $0 | $0 | - | - | - |
| Proposed Design - Gas Heating 82% Efficient: | $312,007 | $7,610 | $0 | $0 | $7,610 | $1,980 | 3.8 |
| Proposed Alternative - Heat Pump Heating: | $582,702 | $278,306 | $9,324 | $22,652 | $255,654 | -$48,760 | Does Not Payback |

**Table 6: Added First Cost and Operating Cost for Heat Pump System (Total – all 3 buildings)**

| | Net Added First Cost | Net Added Operating Cost |
|---|---|---|
| **Heat Pump Heating System for entire site** | **$292,184** | **$59,892** |

--END--

ATTACHMENT 17

DEIR COMMENT LETTERS

#15990.

Secretary of Energy & Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114
Attn: MEPA Office

RE: Parallel Products of New England, LLC

I am **strongly opposed** to the Parallel Products of New England, LLC Waste Transfer Station project at 100 Duchaine Boulevard, New Bedford, MA. We do not need this horrendous project in our neighborhood. FL-1

There is no good reason to impose a facility like this on a community that has plenty of capacity for the disposal of waste. We do not want to be the dumping ground of Southeastern Massachusetts. As a group we will use whatever means necessary to make sure our neighborhood is not dumped on!! FL-2 FL-3

Sincerely,

Signature Kenneth Johnson

Name Kenneth Johnson

Address 1134 Chaffee St
New Bedford MA.
02745

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MAR 6 2019

15990
Form letters
opposed 1,009 + 4 late = 1,013 total
for it 2

*The Commonwealth of Massachusetts*
*Executive Office of Energy and Environmental Affairs*
*100 Cambridge Street, Suite 900*
*Boston, MA 02114*

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Matthew A. Beaton
SECRETARY

Tel: (617) 626-1000
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http://www.mass.gov/eea

April 12, 2019

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
EXPANDED ENVIRONMENTAL NOTIFICATION FORM

| | |
|---|---|
| PROJECT NAME | : Parallel Products of New England |
| PROJECT MUNICIPALITY | : New Bedford |
| PROJECT WATERSHED | : Buzzards Bay |
| EEA NUMBER | : 15990 |
| PROJECT PROPONENT | : Parallel Products of New England, LLC |
| DATE NOTICED IN MONITOR | : February 20, 2019 |

Pursuant to the Massachusetts Environmental Policy Act (MEPA; G. L. c. 30, ss. 61-62I) and Section 11.06 of the MEPA regulations (301 CMR 11.00), I have reviewed the Expanded Environmental Notification Form (EENF) and hereby determine that this project **requires** an Environmental Impact Report (EIR). I am declining to allow a Single EIR as requested by the Proponent. The Proponent must submit a Draft EIR (DEIR) in accordance with the Scope provided in this Certificate. In a separate Draft Record of Decision (DROD), also issued today, I **propose to grant** a Waiver that will allow the proponent to proceed with Phase 1 of the project prior to completing the MEPA process for the entire project.

Project Description

As described in the ENF, the project includes the phased construction of a glass recycling/processing facility; a solid waste handling and processing facility that will accept 1,500 tons per day (tpd) of municipal solid waste (MSW) and construction & demolition (C&D) waste; and a biosolids drying facility that will accept 50 dry tpd of biosolids. Phase 1 includes construction of a glass recycling/processing facility within a 27,500-square foot (sf) building, construction of a railroad (RR) sidetrack from the main RR line to the glass processing facility, and installation of a 1.9 megawatt (MW) solar photovoltaic (PV) array. The glass recycling/processing facility will recycle glass collected through the Massachusetts bottle deposit system. Glass processing will include crushing, sizing and separation of the glass by color. Processed glass will be stored in bunkers until it is loaded into rail cars or trucks to shipment for bottle manufacturers. Phase 1 is proposed to meet an immediate regional need for glass processing in the region by providing an alternative market for glass that would otherwise be disposed.

Phase 2 includes construction of the MSW and C&D transfer station and the biosolids drying facility and extension of the RR sidetrack to service these facilities. Phase 2 will construct a 50,000-sf waste handling building which will be connected to an existing 103,000-sf building. The larger building will house processing equipment which will remove waste ban items and separate out recyclable materials. It also includes construction of a stand-alone 30,000-sf building to house the biosolids processing equipment. Biosolids processing will consist of drying the biosolids to reduce the volume and tonnage of the material prior to off-site disposal. Shipment of all outbound material will primarily occur via rail car.

Project Site

The 71-acre project site is located within the New Bedford Industrial Park at 100 Duchaine Boulevard in New Bedford. The site is generally bounded by industrial properties and Samuel Barnet Boulevard to the north, Phillips Road to the east, undeveloped land to the south, and a rail line and the Acushnet Cedar Swamp State Reservation to the west. The site was previously developed by the Polaroid Corporation and contains access roads, parking areas, stormwater management infrastructure and numerous buildings. The Proponent purchased the site in 2016 and has relocated a portion of its processing and recycling operations from 969 Shawmut Avenue to the project site. The site also contains 1.5 MW of solar PV mounted on a series of carport canopies. Access to the site is provided from Duchaine Boulevard, via an internal one-way loop roadway surrounding the proposed facility. The site has adequate area to support truck movement and access and is easily accessible from Route 140 (Alfred M Bessette Memorial Highway) via Braley Road or Phillips Road.

Wetland resource areas in the vicinity of the project include Bank, Bordering Vegetated Wetlands (BVW), Land under Water (LUW), and Riverfront Area. The project site is not located in Priority and/or Estimated Habitat as mapped by the Division of Fisheries and Wildlife's (DFW) Natural Heritage and Endangered Species Program (NHESP) or an Area of Critical Environmental Concern (ACEC). The site does not contain any structures listed in the State Register of Historic Places or the Massachusetts Historical Commission's (MHC) Inventory of Historic and Archaeological Assets of the Commonwealth.

Environmental Impacts and Mitigation

According to the EENF, potential environmental impacts of Phase 1 include alteration of 4.6 acres of land, creation of 21,780 sf of impervious area, generation of 108 new average daily vehicle trips (adt), consumption of 150 gallons per day (gpd) of potable water, and generation of

150 gpd of wastewater. Phase 1 will impact BVW (4,087 sf), Bank (36 linear feet (lf), and Riverfront Area (900 sf). The EENF describes commitments to avoid, minimize and mitigate environmental impacts associated with Phase 1 including: limiting all glass processing to an enclosed building; designing the RR crossing to reduce impacts to BVW and RFA; wetland replication; constructing the project on a previously altered site; use of rail to ship glass off-site; construction period erosion and sedimentation control measures; and generating renewable energy with solar PV systems.

Potential environmental impacts associated with full-build of the project include alteration of 8.8 acres of land; creation of 3.5 acres of impervious area; generation of 568 new adt (including employee trips), an increase in water demand of 13,000 gpd of potable water, and an increase in wastewater flow of 82,975 gpd of wastewater. The project will also generate GHG emissions associated with the project's energy use and trip generation. Measures to avoid minimize, and mitigate project impacts include constructing the project on a previously altered site; limiting all discharge and handling of solid waste to the enclosed tipping floor; limiting all biosolids processing to an enclosed building; use of rail to transport the majority of material from the site; installation of a floor drain collection system that drains to a holding tank to prevent groundwater contamination; erosion and sedimentation controls; stormwater management controls and implementation of Best Management Practices (BMPs) to minimize odor, dust, noise, and litter impacts.

Jurisdiction and Permitting

The project is undergoing MEPA review and requires the preparation of a mandatory EIR pursuant to Sections 11.03(5)(a)(6) and 11.03(9)(a) of the MEPA regulations because it requires State Agency Actions and will result in: New Capacity for storage, treatment, processing, combustion or disposal of 150 or more wet tpd of sewage sludge and New Capacity of 150 or more tpd for storage, treatment, processing, or disposal of solid waste (respectively). Because it requires an EIR, the project is subject to review in accordance with the MEPA Greenhouse Gas (GHG) Emissions Policy and Protocol. The project is also subject to the Executive Office of Energy and Environmental Affairs' Environmental Justice (EJ) Policy.

Phase 1 of the project will receive Financial Assistance from the Massachusetts Department of Transportation (MassDOT) Industrial Rail Access Program (IRAP) in the amount of $500,000. Phase 1 will require an Order of Conditions from the New Bedford Conservation Commission (or in the case of an appeal, a Superseding Order of Conditions from MassDEP) and a new or amended Site Plan Approval from the New Bedford Planning Board.

The remainder of the project will require a Determination of Site Suitability, Authorization to Construct, and Authorization to Operate and may require a Limited Plan Approval (LPA) from MassDEP and a NPDES General Permit (GP) for Construction and/or Multi-Sector General Permit (MSGP) for Stormwater Discharges Associated with Industrial Activity from the U.S. Environmental Protection Agency (EPA). The project will also require a number of local permits from the City of New Bedford, including: Site Assignment from the Board of Health, a new and/or Amended Order of Conditions from the Conservation Commission, and a new and/or amended.Site Plan Approval from the Planning Board.

Because the Proponent is seeking Financial Assistance, MEPA jurisdiction is broad in scope and extends to all aspects of the project that may cause Damage to the Environment, as defined in the MEPA regulations.

Phase 1 Waiver Request

The Proponent submitted an EENF in support of its request for a Phase 1 Waiver, which would allow Phase 1 of the project to proceed prior to completion of the EIR for the entire project. Consistent with this request, the EENF was subject to an extended 30-day public comment period. At the Proponent's request, the comment period was extended for an additional two-weeks and closed on April 12, 2019.

The MEPA regulations at 301 CMR 11.11(1) state that I may waive any provision or requirement in 301 CMR 11.00 not specifically required by MEPA and may impose appropriate and relevant conditions or restrictions, provided that I find that strict compliance with the provision or requirement would:

(a) result in an undue hardship for the Proponent, unless based on delay in compliance by the Proponent; and
(b) not serve to avoid or minimize Damage to the Environment.

The MEPA regulations at 301 CMR 11.11(4) state that, in the case of a partial waiver of a mandatory EIR review threshold that will allow the Proponent to proceed with Phase 1 of the project prior to preparing an EIR, I shall base the finding required in accordance with 301 CMR 11.11(1)(b) on a determination that:

(a) the potential environmental impacts of Phase 1, taken alone, are insignificant;
(b) ample and unconstrained infrastructure facilities and services exist to support Phase 1;
(c) the project is severable, such that Phase 1 does not require the implementation of any other future phase of the project or restrict the means by which potential environmental impacts from any other phase of the project may be avoided, minimized or mitigated; and
(d) the agency action(s) on Phase 1 will contain terms such as a condition or restriction, so as to ensure due compliance with MEPA and 301 CMR 11.00 prior to commencement of any other phase of the project.

Single EIR Request

The Proponent submitted an EENF and requested that I permit the filing of Single EIR, rather than a Draft and Final EIR. A Single EIR may be allowed, provided I find that the EENF: a) describes and analyzes all aspects of the project and all feasible alternatives, regardless of any jurisdictional or other limitation that may apply to the Scope; b) provides a detailed baseline in relation to which potential environmental impacts and mitigation measures can be assessed; and, c) demonstrates that the planning and design of the Project use all feasible means to avoid potential environmental impacts.

Review of the EENF

The EENF included a detailed project description, an alternatives analysis, existing and proposed conditions plans, and information regarding traffic impacts, noise impacts, air and odor impacts, and GHG emissions. The Proponent provided supplemental information to the MEPA Office regarding Phase 1, existing operations at the project site, and wetland impacts to facilitate MEPA review.[1] For purposes of clarity, references to the EENF in this Certificate include this supplemental information. The comment period was extended for two-weeks at the Proponent's request to provide additional time to review and comment on the EENF.

The project exceeds solid waste and wastewater threshold and is located within one mile of a designated Environmental Justice (EJ) community. The Proponent consulted with MassDEP and the MEPA Office regarding the enhanced outreach requirements of the EJ Policy. The Proponent published Spanish and Portuguese language versions of the MEPA Public Notice in El Planeta and the Portuguese Times (respectively) in addition to the New Bedford Times. The Proponent also notified the following organizations of the project and MEPA scoping session and provided them with a copy of the EENF: Coalition for Social Justice, Alternatives for Community & Environment, Hands Across the River Coalition, and Old Bedford Village. These were identified as EJ leaders based on consultation with MassDEP. The comment period was extended for two-weeks at the Proponent's request to provide additional time to review and comment on the EENF. The comment period commenced on February 20, 2019 and concluded on April 5, 2019. I accepted all late comments as allowed in accordance with 301 CMR 11.06(3). A MEPA site visit and scoping session was held on March 7, 2019. Spanish and Portuguese translation services were provided at the MEPA scoping session. As noted above, the Proponent will hold a public meeting in early May which will provide another opportunity for public participation and outreach.

I have received numerous comment letters that identify concerns regarding the project and public outreach. During the MEPA review period, the Proponent also agreed to hold a public meeting which will provide the community with an additional opportunity to learn about and comment on the project. The meeting is proposed to be held during the evening at the Pulaski School in the north end neighborhood of New Bedford. It is proposed to be held in early May although a final date has not been selected. Once scheduled, the Proponent will publish notice of the meeting in the Standard Times and will notify the above referenced EJ groups. The Proponent has also created a website (http://parallelproductssustainability.com) which provides information on the project and will be updated to include renderings of the proposed project.

Comments from State Agencies generally support the Phase 1 waiver request. In addition, comments from MassDEP note the important role that the Phase 1 project plays in supporting the alternative market for collecting and diverting glass from disposal. I have also received numerous comment letters from the City, abutters, and other stakeholders that express concerns regarding noise, odor, and traffic and identify the need for additional public engagement. I note that MassDEP's Site Assignment Regulations for Solid Waste Facilities (310 CMR 16.00) and Solid Waste Regulations (310 CMR 19.00) require that facilities be designed and constructed to prevent pollution of land, air and water, and to prevent the creation of nuisance conditions. The

[1] Emails from Whitney Hall (Green Seal Environmental Inc.) to Page Czepiga (MEPA Office) sent 3/5/19, 3/11/19, and 4/2/19.

Scope for the DEIR requires additional public outreach and analysis of project impacts to demonstrate that the project will not disproportionately affect EJ communities. It also requires that the Proponent provide information that addresses the applicable Site Assignment and Solid Waste regulatory approval criteria to support MassDEP permitting.

*Alternatives Analysis*

The EENF identified the criteria the Proponent used to evaluate the following potential sites in New Bedford: Site A- 100 Duchaine Boulevard (71 acres), Site B – 1080 Shawmut Avenue (3.6 acres), and Site C – 781 Church Street. According to the EENF, all three sites are located in industrial zoned areas, are located adjacent to a rail line, and would comply with MassDEP siting criteria established for the waste handling area of solid waste handling facilities. According to the EENF, Site B was not large enough to accommodate a waste handling building and a rail side track of sufficient length necessary for the required rail service. The EENF indicated that Site C could accommodate a waste handling building and sufficient rail side track. According to the EENF, Site C was eliminated as it would require trucks accessing the site to pass numerous residences and the New Bedford Vocation Technical High School. According to the EENF, Site A was selected as the Preferred Alternative as it is located in an existing industrial park, has adequate space to accommodate a waste handling building and rail side track of sufficient length, has good access to high-capacity roads and highways, and will avoid routing trucks through residential areas or past schools.

*Solid Waste*

The Proponent has been operating a glass, aluminum, and plastics container recycling operation at 969 Shawmut Avenue in New Bedford since 2008. The Proponent intends to relocate all recycling operations from 969 Shawmut Avenue to the project site as part of Phase 1. Comments from MassDEP indicate the Proponent holds a General Permit for its recycling operations and submitted Annual Certification on May 11, 2018, as required by 310 CMR 16.04. I refer the Proponent to MassDEP's comments which provide guidance on the annual certification requirements. Phase 2 will be regulated in accordance with MassDEP Site Assignment Regulations for Solid Waste Facilities (310 CMR 16.00) and Solid Waste Facility Regulations (310 CMR 19.00). The EENF included a detailed description of project operations and a preliminary site suitability application (BWP SW 01) which addresses how the project will meet MassDEP Site Suitability Criteria. The criteria include avoiding handling of waste in areas contributing to ground or surface water supplies or in the Riverfront Area, setbacks from residential areas, minimizing impacts to traffic and air quality and avoiding, or minimizing impacts to other sensitive resources including agricultural land, rare species habitat, Areas of Critical Environmental Concern (ACEC) and open space. According to the draft Site Suitability Application included in the EENF, the project design and location conform with the criteria. I refer the Proponent to comments from MassDEP which identify additional information necessary to demonstrate consistency with the criteria.

As described in the EENF, MSW, C&D, glass, and biosolids will be delivered to the facility by truck between 6:00 AM and 6:00 PM, Monday through Saturday. Biosolids delivery may also occur on Sunday between 6:00 AM and 6:00 PM. The facility will receive C&D, baled

MSW, and loose MSW in live floor trailers, transfer trailers, and packer trucks (respectively). Trucks will be weighed on a truck scale and backed into the 50,000-sf waste handling building to tip their load. Processing equipment and manual picking lines will remove waste ban items from the mixed waste and separate other recyclable materials for recycling or diversionary uses. Extracted recyclables will be sent to recycling markets by rail or truck and residual waste will be baled, shrink-wrapped, and transported via rail to off-site disposal. All biosolids processing will be done within a separate enclosed building with two odor control systems. The facility will accept both dewatered cake biosolids and thickened wet slurry biosolids. Wet slurry biosolids will be stored in tanks until they are dewatered via centrifuge or screw press. The dewatered biosolids cake will be blended with other biosolids cakes and directed to a thermal dryer that utilizes a natural gas burner. The biosolids will be dried to approximately 90% solids and sent for disposal via railcar or truck.

The following BMPs were incorporated into the project design to minimize potential impacts to the site and surrounding environment:

- All tipping, handling, and loading of MSW/C&D and all biosolids processing will occur within fully enclosed buildings;
- Tipping floor will be constructed of impervious concrete and include a floor drain collection system that drains to a holding tank to prevent contamination of groundwater;
- Use of a fine atomized misting system within the MSW handing and processing buildings to control fugitive dust and odor;
- Regular daily clean-up and sweeping to control fugitive dust on external paved surfaces;
- Use of a negative pressure air collection system, wet scrubber, and ionization system to reduce odors from the biosolids facility; and
- Designing building stacks with adequate heights and exit velocities to facilitate air dispersion.

Demolition of existing buildings will generate C&D waste, portions of which may contain asbestos. Removal or abatement of regulated asbestos-containing material must be completed consistent with the requirements of 310 CMR 7.00. I encourage the Proponent to incorporate C&D recycling activities into project plans and refer the Proponent to MassDEP's comment letter which provides regulatory guidance on Asphalt, Brick, and Concrete (ABC) recycling and processing.

*Environmental Justice*

Because the project exceeds MEPA EIR thresholds for wastewater and solid waste and is located within one mile of an EJ Community, it is subject to the EEA EJ Policy and requirements for enhanced public participation and enhanced analysis of impacts and mitigation. The EJ Policy was designed to improve protection of minority and low income communities from environmental pollution as well as promote community involvement in planning and environmental decision-making to maintain and/or enhance the environmental quality of their neighborhoods. The Proponent's outreach efforts and the enhanced outreach requirements of the

EJ Policy were identified earlier in this Certificate. The EENF identified one census block group designated as an EJ community (i.e. 25% or more of the residents area are minority) that is located within one mile of the project. The EENF included an "Environmental Justice Analysis" (Appendix J) which provided an assessment of baseline public health conditions, analysis of potential air impacts, and measures to avoid, minimize, and mitigate said impacts. It included an evaluation of the baseline health of the EJ communities in the broader area surrounding the project site using data from the Department of Public Health's (DPH) Environmental Public Health Tracking website. The analysis reviewed cancer data (from 2000 to 2013), the incidences of asthma (from 2000 to 2014), acute myocardial infarctions (AMI) (from 2000 to 2014), and Chronic Obstructive Pulmonary Disease (COPD) (from 2000 to 2014).

The analysis found that occurrences of these issues vary in the surrounding area with New Bedford having rates above the statewide average and Acushnet and Dartmouth having rates similar to or lower than the statewide average. Based on the results of the air quality dispersion model, the EENF concluded that the project will comply with all health-protective standards and will not cause or contribute to any health-protective exceedances of air quality concentrations. Specifically, the project will not exceed NAAQS/MAAQS which were established to "provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly" or MassDEP's AALs and TELs which were developed to evaluate potential human health risks from exposures to airborne chemicals. Comments from MassDEP identify concerns regarding adverse impacts to proximate sensitive receptors (two schools and a daycare) and request an expanded discussion of potential project-related impacts to these sensitive receptors.

*Wetlands/Stormwater*

The Proponent provided supplemental information to the MEPA Office to clarify a slight reduction in wetland impacts based on plan refinements that occurred after the EENF was submitted.[2] According to this supplemental information, Phase 1 will impact BVW (4,087 sf), Bank (36 lf), and Riverfront Area (900 sf). Remaining development, which will be addressed in the DEIR, will not impact wetland resource areas. The New Bedford Conservation Commission will review Phase 1 to determine its consistency with the Wetlands Protection Act (WPA), the Wetlands Regulations (310 CMR 10.00), and associated performance standards, including the Stormwater Management Standards (SMS). According to the EENF, all wetland impacts are associated with construction of the rail spur over a drainage swale and a BVW crossing. The EENF indicated the Proponent will provide wetlands replication to mitigate impacts to BVW. Comments from the City indicate they will require mitigation at a 1.5:1 ratio of mitigation to impacts. I anticipate that the Proponent will coordinate closely with the City Conservation Agent to provide appropriate wetland replication while reducing tree clearing. I refer the Proponent to comments from the City that note an outstanding compliance issue that must be remedied prior to the commencement of site work.

The following measures were incorporated to reduce wetland impacts: crossing perpendicular to the swale and BVW to minimize the impacted area, installation of a box culvert

[2] Emails from Whitney Hall (Green Seal Environmental Inc.) and Christian Farland (Farland Corp.) to Page Czepiga (MEPA Office) sent 4/2/19 and 4/8/19, respectively.

within the alignment of an abandoned bridge to cross the swale, locating the swale crossing within previously disturbed soils, aligning the BVW crossing so a portion of the crossing can be constructed on an isolated area of uplands within the wetland, and use of retaining walls (in-lieu of sloped embankments) to construct the BVW crossing to reduce wetland impacts. Comments from MassDEP request additional consideration of alternative designs that will further reduce impacts to wetland resource areas. In an email dated March 29, 2019, the Proponent prepared a response to MassDEP's comments which elaborated on crossing structures considered for the site and confirmed that the crossings will comply with MA Stream Crossing Standards. Supplemental comments from MassDEP identify additional information that should be provided during permitting, including an expanded analysis to address the applicable Riverfront Area performance standards and information to demonstrate the project's compliance with the MA Stream Crossing Standards and support its designation as a Redevelopment Project per at 310 CMR 10.58(5).

The existing stormwater management system includes a series of catch basins, detention ponds, and subsurface infiltration systems. According to the ENF, the existing stormwater management system will continue to serve the site as the project will not significantly increase impervious area or result in significant changes to site drainage or topography. Comments from MassDEP note that components of the stormwater management system may be subject to the *Underground Injection Control* (UIC) program and provide guidance on NPDES permitting.

*Transportation/Traffic*

The EENF included a Traffic Impact and Assessment Study (TIAS) which was performed in general conformance with MassDOT/EEA's Guidelines for *EIR/EIS Traffic Impact Assessments.* Comments from MassDOT indicate the study area is adequate for capturing the traffic impacts of the project. The TIAS concluded that Phase 1 of the project will generate approximately 108 new trips per day (54 vehicles entering and 54 vehicles exiting). Full-build of the project will generate 418 new truck trips per day (209 truck trips entering, 209 truck trips existing). In addition, employees will contribute approximately 150 vehicle trips (75 entering, 75 exiting) for a total of 568 vehicle trips accessing the site on an average weekday. Trip generation was calculated based on empirical data collected from a similar solid waste facility in Rochester, MA. The Proponent anticipates shipping all outbound material by rail. To provide a conservative analysis, the trip generation calculations assumed all outbound material would be transported by truck. The planned use of rail for outbound shipment would reduce trip generation by approximately 110 trips per day. I refer the Proponent to comments from MassDOT and the City which request the Proponent commit to and implement a Transportation Demand Management (TDM) program to reduce trip generation. Comments from MassDOT also identify bus stops located in close proximity to the site and encourage the Proponent to design access roads in accordance with Complete Street standards to facilitate opportunities to walk and bike to the site and proximate transit connections.

The TIAS included a summary of study area crash rate data for the five year period of 2011-2015 which identified two unsignalized intersections[3] that exceed the MassDOT-District 5

[3] The two intersection locations are: 1) Braley Road/Theodore Rice Boulevard at Phillips Road and 2) Theodore Rice Boulevard at Duchaine Boulevard.

and state-wide average rates. Comments from MassDOT indicate that the additional traffic volume generated by the project is not expected to significantly impact safety at these intersections. According to the TIAS, there are no Highway Safety Improvement Program (HSIP) high crash cluster intersections within the study area. The TIAS included capacity analyses at study area intersections for the weekday morning (AM) and evening (PM) peak hours for 2018 Existing, 2025 No-Build, and 2025 Build conditions. The addition of project-generated traffic will cause certain turn movements to experience slightly increased delays compared to the 2025 No-Build conditions. The TIAS indicated the delays are generally not significant to impact the LOS and noted that the impacted locations will continue to operate under capacity in 2025 Build Conditions.

*Greenhouse Gas Emissions*

The EENF included a GHG analysis consistent with the MEPA GHG Policy (the Policy). The Policy requires projects to quantify carbon dioxide ($CO_2$) emissions and identify measures to avoid, minimize, or mitigate such emissions. The analysis quantified the direct and indirect $CO_2$ emissions associated with the project's energy use (stationary sources) and transportation-related emissions (mobile sources). I note the City of New Bedford is a designated Green Community under the provisions of the Green Communities Act of 2008. As such, the City has adopted the Commonwealth of Massachusetts' Stretch Code (SC).The project will be required to meet the applicable version of the SC in effect at the time of construction. The SC requires at least a 10-percent reduction in energy use compared to the base Building Code requirements. Stationary sources were evaluated using equipment assumptions and and excel spreadsheets. Mobile GHG emissions were estimated using information from the TIAS, MOVES $CO_2$ emission factors, and followed the standard methodology outlined in MassDEP's *Guidelines for Performing Mesoscale Analysis of Indirect Sources* (May 1991). Mobile source emissions were calculated for local on-road process truck deliveries, employee vehicle trips, onsite and offsite idling, and the use of front-end loaders for glass and MSW/C&D handling.

The GHG analysis evaluated $CO_2$ emissions for two alternatives as required by the Policy including: 1) a Base Case compliant with the 9th Edition of the Massachusetts Building Code , and 2) a Preferred Alternative (Mitigation Alternative) that incorporates additional energy saving measures. The 9th Edition of the Building Code references the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) 90.1-2013 and the International Energy Conservation Code (IECC) 2015. The EENF indicated that the equipment for processing the glass and MSW/C&D is industry standard and would not differ from the base case scenario. It also indicated that the glass recycling and MSW/C&D processing buildings will be unconditioned spaces. Based on this, the GHG analysis for the glass recycling and MSW/C&D processing facilities was limited to the energy use associated with their buildings, specifically the lighting demands. Similarly, the GHG analysis for the biosolids processing facility was limited to the energy use associated with lighting, ventilation, and heating demands. The EENF identified those measures that will be incorporated into the project design, measures that were dismissed as infeasible or inappropriate, and measures that will be studied further during advanced design stages.

The Proponent has committed to incorporate the following measures to reduce GHG emissions:

- Installation of 1.9 MW of solar PV via canopy (carport and shed) and rooftop arrays during Phase 1 (in addition to existing 1.5 MW on-site PV array);
- Reduced Lighting Power Densities (LPD) to achieve a 10% reduction over Code requirements in all buildings;
- Construction of all new buildings as solar PV-ready with appropriate structural capacity and space allocations for solar PV arrays;
- Energy-Efficient condensing boiler for heating the biosolids processing building; and
- Construction waste recycling.

Because the project is at a conceptual design level, the Proponent has an opportunity to consider incorporation of additional GHG reduction measures. As recommended by DOER, the Proponent should consider a further reduction in LPD and the use of cold-climate heat pumps to provide space heating in the biosolids processing building. I acknowledge and appreciate the Proponent's commitment to renewable energy which will assist the Commonwealth in meeting its overall GHG reduction goals stated in the Global Warming Solutions Act of 2008. The Proponent has installed 1.5 MW of solar PV at the site and will install an additional 1.9 MW of solar PV in Phase 1. Installation of the 1.9 MW solar PV array will generate 2,499 MWh/year and result in a GHG reduction of 907 tpy. The combined 3.5 MW array will generate 4,543 MWh/year for a total GHG reduction of 1,647 tpy.

The EENF evaluated and quantified the GHG reductions that could be achieved by implementing the following measures in the biosolids processing facility: advanced vacuum drying technology (2,393 tpy) and variable frequency drives (VFDs) in the ventilation system (36 tpy) and process motors (211 tpy). The EENF indicated the Proponent cannot guarantee these GHG reductions as they were based on conceptual engineering estimates and/or vendor representations. Based on this, these additional measures were not included as GHG mitigation commitments. It is unclear whether they will be incorporated into the project. This should be addressed in the DEIR. The EENF also indicated that the Proponent is evaluating gasification of dried biosolids for a later stage of the project. Gasification is not proposed at this time. If the Proponent intends to incorporate gasification into the project at a later date, it would be subject to a Notice of Project Change (NPC) to the MEPA Office and additional review, permitting and air quality analysis.

Phase 1 stationary source $CO_2$ emissions were estimated at 102 tpy in the Base Case. Adoption of energy efficient lighting will reduce stationary source $CO_2$ emissions by 10 tpy, for a total of 92 tpy or a 10% decrease. Installation of the 1.9 MW solar PV array will reduce GHG emissions by 907 tpy. The EENF indicated the estimated number of new trips associated with the Phase 1 project (108 new trips) is not anticipated to generate a significant level of mobile source GHG emissions. To be conservative, the EENF did not take credit for the reduction in mobile source emissions associated with shipping outbound materials by rail instead of trucks or the reduced travel from trucks transferring materials from their point of origin within the greater New Bedford area to more distant facilities. The GHG emissions (Table 7 of Appendix C) for full-build of the project are summarized below.

| | BASECASE | PROPOSED | DIFFERENCE | |
|---|---|---|---|---|
| | | | TPY | % |
| **MOBILE SOURCE EMISSIONS** | **3,377** | **3,377** | **0** | **0** |
| **STATIONARY SOURCE EMISSIONS** | **10,898** | **10,835** | **63** | **-0.58%** |
| *Glass Recycling* | *102* | *92* | - | - |
| *MSW/C&D Processing* | *314* | *282* | - | - |
| *Biosolids Processing* | *10,482* | *10,461* | - | - |
| **1.9 MW SOLAR PV** | | -907 | - | - |
| **TOTAL** | **14,275** | **13,305** | **970** | **-6.80%** |

*Air Quality*

The project will require a Limited Plan Approval (LPA) from MassDEP to ensure that the project, and the facility as a whole, conforms to National Ambient Air Quality Standards (NAAQS) and the Massachusetts Ambient Air Quality Standards (MAAQS). MassDEP's permitting process may include a review to demonstrate compliance with the Best Available Control Technology (BACT) review. The EENF included an Air and Odor Analysis (Appendix D) which evaluated emissions associated with stationary combustion sources, mobile diesel equipment, dust from material handling, and potential odor sources. The analysis used the U.S. EPA's AERMOD air dispersion model to determine potential air quality impacts associated with the above emissions on proximate residential receptors. To be conservative, the analysis assumed all outbound shipment of material will occur via truck. The analysis quantified potential emissions from the project for nitrogen dioxide ($NO_2$), particulate matter up to 2.5 micrometers in size ($PM_{2.5}$), and MassDEP air toxics and compared them to the NAAQS and MassDEP's Ambient Air Levels (AALs) and Threshold Effect Exposure Limits (TELs).

The analysis also evaluated potential odors from MSW tipping and processing and biosolids processing. These were compared against the recommended odor concentration limit in MassDEP's "Draft Odor Policy for Component Facilities". The analysis identified the following measures to reduce air quality and odor impacts: wet scrubbing for air emanating from the biosolids dryers; ionization for oxidation of the air constituents emanating from the biosolids dewatering operations; and designing building stacks to facilitate air dispersion. Based on the results of the air dispersion modeling, predicted air pollutant, and odor concentrations are shown to be below the applicable NAAQS/MAAQS, MassDEP AALs and TELs at residences, and protective odor concentration criterion at residences. Based on this, the analysis concluded that the project as designed, will not cause or contribute to a condition of air pollution in the area.

*Noise*

The EENF included a Sound Level Assessment Report (Appendix D) which provided a description of the applicable noise regulatory requirements, a brief explanation of noise terminology, a summary of the results of the complete ambient sound level monitoring program, and a discussion of the sound level modeling analysis for the proposed project. The EENF also discussed the project's consistency with the MassDEP Noise Policy. The primary noise sources of the project include MSW/C&D tipping and handling, ventilation equipment, outdoor front-end loader at the glass handling building, process ventilation equipment at the biosolids building, and four cooling towers. The project and majority of on-site equipment will operate 24 hours/day and 7 days per week, with the exception of the outdoor front-end loader at the glass processing building which will operate from 7:00 AM to 10:00 PM. I refer the Proponent to comments from MassDEP which identify additional sound sources that should be incorporated into the analysis.

The MassDEP Noise Policy limits new noise-generating equipment to a 10-dBA (A-weighted decibel) increase in the ambient sound measured at the property line and at the nearest residences. The EENF provided a summary of the results from sound level modeling measured at four representative locations around the facility and within the community. The locations were selected to represent the closest sensitive receptors (primarily residential) surrounding the project site. The analysis identified the following measures that were incorporated into the project to reduce noise impacts: electric rail car pusher to move rail cars within the site, fan silencers or low noise exhaust fans on the biosolids building, silencer or low noise unit in the scrubber stack and quiet cooling towers or construction of a sound barrier wall (50-ft long by 15-ft tall) along the southern edge of the biosolids building to shield the residential area from the sound generated by cooling towers. With implementation of the proposed mitigation, modeled future daytime and nighttime sound levels from the project are predicted to increase the measured background sound levels by 3 to 8 dBA at all modeled residential receptor locations, thereby demonstrating consistency with the MassDEP Noise Policy limit. Modeling also indicates that the proposed project is not expected to create any "pure tone" conditions, as defined by MassDEP, when combined with existing background sound levels at any modeled receptor locations.

*Water/Wastewater*

According to the EENF, the project will increase water demand by 13,000 gpd and will increase wastewater flows from the site by 82,975 gpd. Wastewater generation is primarily associated with water removed from biosolids either by dewatering or by drying/condensing. The project will be served by municipal water and sewer infrastructure. Comments from MassDEP indicate the City has an EPA approved Industrial Wastewater Pretreatment Program (IPP). The Proponent should consult with the City to determine measures necessary to comply with the City's IPP. I refer the Proponent to comments from the City which requests analysis to determine whether existing infrastructure can accommodate and treat the wastewater flows. Comments from MassDEP encourage the Proponent to implement measures to reduce water consumption.

<u>Conclusion</u>

Based on review of the EENF, consultation with State Agencies, and a review of comment letters, I hereby require the Proponent to file a Draft EIR and Final EIR. The Scope below identifies additional information and analysis that should be provided in the DEIR to demonstrate that environmental impacts have been minimized, avoided and mitigated to the maximum extent feasible; to demonstrate that the project will not disproportionately an EJ community; and to provide information and analysis for permitting agencies to evaluate consistency with regulatory standards and to make associated Section 61 Findings.

In a separate DROD, also issued today, I propose to grant a Waiver that will allow the Proponent to proceed with Phase 1 of the project prior to completing the MEPA process for the entire project. The Phase 1 waiver is limited to the construction of a glass recycling/processing facility, a RR sidetrack from the main RR line to the glass processing facility, and a 1.9 MW solar PV array. The DROD addresses the project's consistency with the criteria for a Phase 1 Waiver and related conditions.

## SCOPE

### General

MEPA-1

The EIR should follow Section 11.07 of the MEPA regulations for outline and content, as modified by this Scope. The majority of the EENF was comprised of the preliminary site suitability application with appended technical studies. This provided information for review by State Agencies and the public; however, the DEIR must contain a full and self-contained description and analysis of the project. It should provide additional narrative to explain and support the analysis of the project's impacts and mitigation, and extract relevant documentation and tables from technical appendices to supplement the narrative. The DEIR should include a comprehensive narrative with a separate chapter for each of the categories identified herein.

### Project Description and Permitting

MEPA-2

The DEIR should include a detailed description of the existing and proposed conditions, describe any changes to the project since the filing of the EENF, and should provide an update on Phase 1. The DEIR should include updated site plans for existing and post-development conditions at a legible scale. It should provide a brief description and analysis of applicable statutory and regulatory standards and requirements, and a description of how the project will meet those standards and provide an update on the state, federal, and local permitting process. The DEIR should provide an update that describes all of the enhanced public outreach efforts and meetings that have occurred since the EENF was submitted in accordance with the EJ Policy.

The DEIR should show areas of land alteration for buildings, roadways, parking, wastewater, water and stormwater infrastructure, lawns and landscaping, and other project components. The DEIR should describe the project's consistency with the City's current Master Plan and the Southeast Regional Planning and Economic Development District's (SRPEDD) current Regional Policy Plan. It should also include a discussion of the facility's role in achieving the Commonwealth's goals as outlined in MassDEP's Solid Waste Master Plan.

### Solid Waste

MEPA-3

The DEIR should include a narrative summary that describes how C&D, baled and loose MSW, and dewatered cake and thickened wet slurry biosolids, will be delivered, transferred from vehicles, processed, and shipped-off site. The DEIR should address the issues identified in the "Suitability Criteria" section of MassDEP's comment letter (dated March 22, 2019). The DEIR should include a narrative description and supporting figures that describes the movement of empty and full railcars on the site, including the new rail spurs and extended sidetrack. It should provide plans that show the waste handling area and associated 500-foot setback from residential properties, including the newer residences referenced in MassDEP's comments. Plans should also depict wetland resource areas in relation to the proposed waste handling area. The DEIR should address the project's consistency with applicable site suitability criteria. Comments from the City identify concerns regarding the explosion/combustion potential of dried biosolids. The DEIR should address this issue and identify associated mitigation measures, as appropriate. It should also describe contingency plans for processing biosolids if one or more dryer becomes unavailable.

Environmental Justice MEPA-4

In accordance with the EJ Policy, the Proponent must provide enhanced public outreach of the DEIR to EJ populations in New Bedford. Enhanced public outreach should include preparation and distribution of a fact sheet that provides a summary of the project, environmental impacts (including air quality), and public comment opportunities. The fact sheet should include photos of similar facilities (or direct individuals to a website to view renderings). The project fact sheet should be provided to the public library and City Hall; included on the project website; and provided upon request by residents. Prior to submitting the DEIR, the Proponent should contact the Toxics Action Center, EJ groups identified above, and the City's Planning Department for input on alternative media outlets and information repositories in which to provide notice of the DEIR. The Proponent should consult with the MassDEP's and/or EEA's Environmental Justice Director during preparation of the DEIR regarding the proposed circulation and participation plan to ensure compliance with the EJ Policy.

I have received numerous comment letters that identify concerns regarding the project and public outreach. As noted above, the Proponent will be holding a public meeting to discuss the project, its potential environmental impacts, and mitigation measures. The DEIR should provide a detailed update that describes all of the proponent's enhanced public outreach efforts and meetings that have occurred since the EENF was submitted.

Comments from MassDEP identify concerns regarding adverse impacts to proximate sensitive receptors (two schools and a daycare) that are generally located within a one-mile radius of the project. Other comments identify concerns with potential mobile source emissions, air quality, noise, and odor impacts on vulnerable populations (children and the elderly). Because the project is sited within one mile of a designated EJ population, the DEIR should expand on the discussion of air dispersion modeling results provided in the EENF to identify the direction and extent of potential impacts and to inform development of effective mitigation measures. The DEIR should evaluate increased buffers between property lines and sources of noise/air emissions, increased plantings and vegetated buffers or other barriers to reduce potential impacts.

The EENF indicated that New Bedford has statistically higher rates of environmentally-related health outcomes, including asthma and COPD. The DEIR should discuss the current and future impacts that climate change (including extended periods of drought, and extreme temperatures) will have on air quality within the EJ populations. The DEIR should evaluate development of a plan to reduce air emission and odor impacts that will be implemented on days when the National Oceanic and Atmospheric Administration (NOAA) issues air quality alerts. In addition, the Proponent should consider implementing an air emissions monitoring plan to track the project's air emissions and identify thresholds which would trigger an evaluation of the need to implement additional mitigation to reduce air quality and odor impacts. The Proponent should also consult with MassDEP and the City's Health Agent to develop a system to log and track odor, noise, and dust complaints during the construction and operational phases of the project. The DEIR should describe the plan and how the community will be notified of the system.

Wetlands/Stormwater MEPA-5

During MEPA review of the EENF, the Proponent indicated project plans were refined to eliminate all wetland impacts associated with the remaining development. The DEIR should provide project plans and a supporting narrative that describes how the project was designed to avoid, minimize, and mitigate impacts to wetland resource areas. This narrative should also provide an update on Phase 1, including any design revisions that further reduced wetland impacts and the location and size (sf) of the wetland replication area. The DEIR should also provide plans that clearly identify new impervious areas and should evaluate all feasible methods to reduce impervious surfaces, including reduced parking ratios, narrow driveway widths, etc. The DEIR should describe the project's stormwater management system and provide conceptual plans identifying existing and proposed stormwater infrastructure. It should discuss how the project will comply with the requirements of applicable stormwater programs, including but not limited to MassDEP's SMS and NPDES GP and/or MSGP (as applicable). The DEIR should consider retrofitting the existing stormwater management system and incorporating additional low impact development (LID) measures to improve water quality.

Transportation/Traffic MEPA-6

Traffic accessing the site will travel through the Theodore Rice Boulevard/Braley Road at Phillips Road intersection in the easterly and westerly directions. This intersection operates as a 4-way stop sign-controlled location. The DEIR should provide revised traffic modeling to reflect this condition. It should provide information to demonstrate that vehicle queues will not block the proximate Route 140 off-ramps. Comments from MassDEP note that the Proponent must commit to limiting the maximum number of vehicles utilizing the site to that presented in the traffic study, or revise the traffic study to reflect the maximum proposed site traffic flow rate. The DEIR should address this and provide a revised traffic study, as necessary.

The DEIR should include a thorough evaluation of TDM measures to reduce site trip generation, including the measures identified in comments from MassDOT and the City. All feasible measures should be incorporated into a TDM plan for the project. The DEIR should include the draft TDM plan and a commitment by the Proponent to implement said plan. I encourage the Proponent to improve bicycle and pedestrian connectivity between the site and adjacent land uses, including proximate bus stops.

Greenhouse Gas Emissions MEPA-7

The FEIR should include a revised GHG analysis that includes the additional information and analyses requested in DOER's comment letter. The DEIR should clarify whether VFDs (for ventilation and process motors) and advanced vacuum technology will be incorporated into the biosolids processing building. If not included as mitigation commitments, the DEIR should provide supporting financial analysis or data to support the dismissal of these measures. The DEIR should clarify the planned code pathway and which two measures have been incorporated into the "Base Case" Scenario as required by Section C406.1 of the Building Code and/or should revise the GHG analysis accordingly. The DEIR should provide additional information on the construction type, building envelope, and space heating output of the biosolids processing building. As recommended by DOER, the revised GHG analysis should evaluate reducing LPD to achieve a 20% reduction over Code requirements in all buildings (vs 10% currently proposed) and the use of cold-climate heat pumps to provide space heating in the biosolids buildings. The DEIR should present the results of calculations used to establish the existing/baseline condition(s), the build condition(s), and the impact of proposed emissions-reduction mitigation. If the project does not incorporate additional reductions in LPD or cold-climate heat pumps, the DEIR should explain, in reasonable detail, why the use of these measures which could provide significant GHG reductions, were not selected. The Proponent should consult with DOER to confirm the approach of the GHG analysis prior to preparing the DEIR. The DEIR should also include a mobile source GHG analysis which has been updated to reflect any changes since the DEIR (as appropriate). The mobile source analysis should quantify the GHG reduction that could be achieved by shipping outbound material by rail instead of trucks.

Air Quality/Noise MEPA-8

The DEIR should include a revised sound analysis that incorporates the additional sound sources identified in MassDEP's comment letter. Prior to filing the DEIR, the Proponent should consult with DPH to identify additional measures that can be incorporated into the project to further reduce impacts to air quality and noise. The DEIR should provide an update on this consultation, including a thorough evaluation of the feasibility and benefits of the identified measures. The Proponent should commit to implementing any measures which are determined to be feasible. The DEIR should confirm the air permitting required by the project and provide an update on the air permitting process, including any BACT analysis.

Water/Wastewater MEPA-9

The DEIR should provide an update on consultations with the City regarding monitoring, metering, and pretreatment necessary to comply with the City's IPP. The DEIR should clarify whether the municipal wastewater infrastructure (including piping and pump stations) is adequate to accept and treat the additional flows from the project and/or should identify any necessary improvements. I refer the Proponent to the City's comment letter for additional guidance. The DEIR should include a draft spills contingency plan to address prevention and management of potential releases of oil and/or hazardous material. At a minimum, the spills contingency plan should address refueling of machinery, storage of fuels, and accidental releases. The DEIR should also identify measures incorporated into the project design to reduce the project's water demand.

Construction Period Impacts MEPA-10

The DEIR should describe construction methodology and sequencing, potential construction period impacts (including but not limited to traffic management, materials management, parking, air quality and noise impacts, and other items as they related to the construction period), and identify feasible measures that can be implemented to eliminate or minimize these impacts. This discussion may be prepared and presented in the DEIR as a draft Construction Management Plan (CMP). The draft CMP should include appropriate erosion and sedimentation control BMPs consistent with applicable NPDES Permit requirements. The project must comply with MassDEP's Solid Waste and Air Pollution Control regulations, pursuant to M.G.L. c.40, §54. The DEIR should discuss the solid waste and air quality regulatory requirements identified in MassDEP's comment letter and identify the specific and aggressive construction recycling and source reduction goals the Proponent will adopt.

Because this project is located in close proximity to a designated EJ population, the Proponent should mitigate the construction period impacts of diesel emissions to the maximum extent feasible. This mitigation may be achieved through the installation of after-engine emission controls such as diesel oxidation catalysts (DOCs) or diesel particulate filters (DPFs), or the use of equipment that meets Tier 3 or Tier 4 emission standards for non-road construction equipment. The DEIR should address how the project will support compliance with the Massachusetts Idling regulation at 310 CMR 7.11.

MEPA-11

Mitigation and Draft Section 61 Findings

The DEIR should include a separate chapter summarizing proposed mitigation measures. This chapter should also include draft Section 61 Findings for each State Agency that will issue Permits for the project. The DEIR should contain clear commitments to implement mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation (either funding design and construction or performing actual construction), and contain a schedule for implementation. To ensure that all GHG emissions reduction measures adopted by the Proponent in the Preferred Alternative are actually constructed or performed by the Proponent, I require Proponents to provide a self-certification to the MEPA Office indicating that all of the required mitigation measures, or their equivalent, have been completed. The commitment to provide this self-certification in the manner outlined above should be incorporated into the draft Section 61 Findings.

Response to Comments

The DEIR should contain a copy of this Certificate, and a copy of each comment letter received. Based on the large volume of form letters received, copies of form letters may be provided electronically. To ensure that the issues raised by commenters are addressed, the DEIR should include direct responses to comments to the extent that they are within MEPA jurisdiction. A single response to form letters can be provided. This directive is not intended, and shall not be construed, to enlarge the scope of the DEIR beyond what has been expressly identified in this certificate. I recommend that the Proponent use either an indexed response to comments format, or a direct narrative response. Responses must specifically address each comment letter on the EENF; references to a chapter or extensive section of the DEIR are not adequate.

Circulation

The Proponent should circulate a hard copy of the DEIR to any State and City Agencies from which the Proponent will seek permits or approvals, and to any parties specified in Section 11.16 of the MEPA regulations. The Proponent must circulate a copy of the DEIR to all other parties that submitted individual written comments. In accordance with 301 CMR 11.16(5), the Proponent may circulate copies of the DEIR to these other parties in CD-ROM format or by directing commenters to a project website address. However, the Proponent should make available a reasonable number of hard copies to accommodate those without convenient access to a computer and distribute these upon request on a first-come, first-served basis. The Proponent should send correspondence accompanying the CD-ROM or website address indicating that hard copies are available upon request, noting relevant comment deadlines, and appropriate addresses for submission of comments. In addition, a hard copy of the DEIR should be made available for review at the New Bedford Public Library. The DEIR submitted to the MEPA office should include a digital copy (e.g., CD-ROM, USB drive) of the complete document.

April 12, 2019
Date

Matthew A. Beaton

Comments received:

Form letters beginning "I am strongly opposed to the…" (1,013 received)
Form letters beginning "I strongly support the…" (two received)

| | |
|---|---|
| 03/08/2019 | Tracy Wallace (1 of 2) |
| 03/18/2019 | Robert Ladino |
| 03/22/2019 | Massachusetts Department of Environmental Protection (MassDEP) (1 of 2) |
| 03/26/2019 | Roger Cabral |
| 03/26/2019 | Cheryl Souza |
| 03/27/2019 | Marlene Pollock |
| 03/27/2019 | Tracy Wallace (2 of 2) |
| 03/27/2019 | Wendy Graca |
| 03/28/2019 | Claire B.W. Miller, Toxics Action Center |
| 03/29/2019 | Massachusetts Department of Transportation (MassDOT) |
| 03/29/2019 | Jonathan F. Mitchell, Mayor, City of New Bedford |
| 03/29/2019 | Department of Energy Resources (DOER) |
| 03/29/2019 | Vincent Carolan |

| | |
|---|---|
| 03/31/2019 | Claudia Ostiguy |
| 04/02/2019 | Ron Cabral |
| 04/02/2019 | Carol Strupczewski |
| 04/05/2019 | MassDEP (2 of 2) |

MAB/PRC/prc

## Czepiga, Page (EEA)

**From:** cstrupczewski@verizon.net
**Sent:** Tuesday, April 02, 2019 9:33 AM
**To:** Czepiga, Page (EEA)
**Cc:** RRCRT@aol.com; cbostiguy@gmail.com; ritalapre@gmail.com; brad.markey@newbedford-ma.gov
**Subject:** EEA15990 Paralles Products

Paige Czepiga
Environmental Analyst
MEPA Office

First of all I want to thank and Secretary Matthew Beaton for the extension to April 5 for allowing residents to write their opposition for Parallel Products of New England plans for its expansion in the New Bedford Business Park with the future possibility of having a wastewater sludge facility.

My immediate concern is Phase I and its final step. If granted this will be devastating to the entire development of Pine Hill Acres more than 350 home, Heritage Estates, Long Built Homes, and Briarwood quality of life for more than a thousand residents. Presently, residents in Pine Hill Acres less than 500 feet for the facility are CS1-1 being awaken with loud noise at night, during the daytime, detection of odors in the neighborhood, and can clearly see the well-lighted outside holding stalls with materials in them from Phillips Road. Abutting the property, there are newly built homes.

As I drove on Phillips Road past the Parallel site at 10 p.m., I could clearly see down from the road the lighted open holding stalls which are less than 200 feet from the street. There are no trees, shrubs, privacy fence CS1-2 around the stalls.

The quality of life in this densely popular area is quickly changing for all of the residents from air to noise to traffic. Phillips Road is a two-lane street and can't take the traffic of heavy vehicles on it multiple times a day CS1-3 which will most likely happen as some trucks will take Exit 5 off of Route 140 to enter the southern area of the Business Park which is closer to the Parallel Products factory.

Please do not grant the Phase I step.

Carol Strupczewski
1075 Braley Road
New Bedford, MA 02745

508-995-6135

**Czepiga, Page (EEA)**

| | |
|---|---|
| **From:** | Cheryl Souza <clsouza@comcast.net> |
| **Sent:** | Tuesday, March 26, 2019 8:06 PM |
| **To:** | Czepiga, Page (EEA) |
| **Subject:** | Parallel Products of New England |

Ms Czepiga,

I have just learned about a project proposed for a location close to my home. I live at 80 Keene Road, in Acushnet, not far from the New Bedford Industrial Park. It has just been brought to my attention that Parallel Products of New England is proposing to bring a biosolid facility to the Industrial Park. I am a strong proponent of environmental cleanliness, and the company does present itself as an environmentaly concious company, however, there has definitely not been enough community outreach regarding the effects on neighbors and the environment they live in.

Parallel Products is also not being truly forthcoming, by denying their plan to implement the "gasification" of biosolids which is in their own words "cutting edge technology". Generally, cutting edge technology really means "we are making this up as we go along." CS2-1

Please postpone the upcoming deadline for the public comment period, the company has not advertised their public forums, nor have they offered them at times the average working class person would be able to attend. CS2-2

In addition, there is an annonymous campaign reaching out to the community with poorly written, blatantly false and repetitive flyers. The website for this campaign is http://stoptheparalleldump.com. It is not uncommon, in today's world, that corporations employ many ways to get their projects completed regardless of community interest. I believe the owner of that website should be brought to light, it could be Parallel Products themselves. CS2-3

thank you for your time,

Cheryl Souza

80 Keene Road

Acushnet, Ma 02743

508-685-0330

CITY OF NEW BEDFORD
JONATHAN F. MITCHELL, MAYOR

March 29, 2019

Executive Office of Energy and Environmental Affairs (EEA)
Attention: MEPA Office
Paige Czepiga: EEA No. 15990
100 Cambridge St, Suite 900
Boston MA 02114

RE: EEA 15990: Parallel Products

Dear Ms. Czepiga,

I write to present the response of the City of New Bedford regarding Parallel Products of New England's (PPNE) proposed facility expansion project at 100 Duchaine Blvd. in our business park.

Given the facility's proximity to a densely populated residential neighborhood, I am troubled by the paucity of PPNE's outreach to public, and particularly to the abutting Pine Hill neighborhood. I believe strongly that there needs to be a much more robust public engagement effort that has been undertaken to date. NB-1

Moreover, I am not convinced that the preliminary impact analysis regarding potential noise, odor, and traffic is adequate given the stakes, and I would encourage MEPA to exercise its oversight authority to ensure that further study is pursued so that the decision-makers and the public alike can have greater confidence in the findings. In sum, unless and until PPNE is able to satisfactorily address reasonable neighborhood concerns in the areas of noise, odor, and traffic, I am not prepared to lend my support to the project. NB-2

In addition to my concerns regarding public engagement and neighborhood impacts, municipal departments have identified a number of specific operational/environmental issues with the proposed facility. These are enumerated below, and are based upon departmental reviews of the EENF submitted to the City of New Bedford in February 2019.

1) ***Land Use Impacts***

The project site is in the City's Business Park, a location established to accommodate most industrial uses. As such, the project site is meant to be buffered from the surrounding neighborhood which is residential to the east. If MEPA should allow the project to proceed, PPNE must be required to ensure that all impacts to this neighborhood are satisfactorily mitigated. This would include all potential noise, odor, or additional traffic impacts. It should be noted that the Land Section of the ENF Form was not completed. As the project is a redevelopment of a previously used industrial site, the responses in this section are not likely to have revealed any otherwise unidentified potential impacts. NB-3

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However, responses would have quantified the amount of land occupied for certain uses (buildings, parking areas, etc.) and would have identified the project's consistency with current City Master Plan and the current Regional Policy Plan of the Southeast Regional Planning and Economic Development District (the regional planning agency whose territory includes New Bedford). Previous environmental studies at the site included a Phase 1 Environmental Assessment and a Limited Subsurface Investigation, by SAGE Environmental. These reports are not included in the EENF, but a table of reported releases to the environment from the Phase 1 Environmental Assessment is provided, showing three releases reported to MassDEP between 1994 and 2008. All three were assigned Release Tracking Numbers (RTNs), and all three either had the RTN retracted or had audits completed. Six previous spills or releases were also identified, between 1978 and 1994, with minimal information on remedial actions. NB-4 NB-5

2) ***Economic Development***

It is recognized that this project would entail a significant economic investment, which would bring a positive return to the City in increased tax revenue and water usage fees. NB-6

3) **Rail Infrastructure, Waste, and Energy Efficiency**

a) **Rail Infrastructure:** PPNE is proposing to add a rail stub in order to utilize rail as an option for shipping out waste materials after processing. This is an important component of the project and is seen as a benefit as it mitigates truck traffic which is already increased significantly.

This rail siding requires the crossing of a Bordering Vegetated Wetland (BVW) and a perennial stream with associated Riverfront area. The ENF states that less than 5000 s.f. of BVW will be impacted by the rail crossing. The plans show that retaining walls will be utilized to minimize wetland impacts from the rail crossing. The wetland boundaries in the vicinity of the crossings have not yet been verified by the Conservation Commission and therefore the square footage of Resource Area impacts cannot be confirmed. This should be provided. NB-7

Rail transport of outgoing material is identified as beneficial for many aspects of the project, including greenhouse gas emissions, other air pollutant emissions, efficient energy usage, and traffic considerations. However, rail transport is faced with uncertainties: The owner of the rail line is not identified; no mention is made of discussions with the railroad owner about installing the proposed rail spur; and MSW is proposed to be baled, wrapped, and shipped in gondola (open-topped) rail cars. At present, CSX, the largest railroad network in the eastern US, will only haul MSW in sealed intermodal containers on flat-bed rail cars. If this policy does not change, the facility must either pack MSW in sealed intermodal containers or ship it off site in trucks. NB-8

The project will be supported by a grant of $500,000 from the Massachusetts Department of Transportation's Industrial Rail Access Program. There is no mention of contingency if this financing does not come through. NB-9

b) **Waste:** The EENF states (erroneously) that the Crapo Hill Landfill is located in New Bedford, and that District member communities "*are not expected to utilize the proposed facility for MSW disposal.*" However, there may be an advantage to some dialog between the District (and/or its member communities) and the project's proponent, to consider some use of the proposed facility to prolong the life of Crapo Hill, and/or to address long range planning for when the Crapo Hill Landfill does close. NB-10

The proposed facility consists of three primary components: A glass bottle processing facility, to accept 200 tons per day (tpd) of glass bottles for crushing and shipment to end-users; A municipal solid waste (MSW) processing facility, that will accept 1,500 tpd for processing and transfer. The proponents expect to extract up to 20%, or 300 tpd, of material for recycling, and ship 1,200 tpd of waste for out-of-state disposal; A wastewater biosolids (sludge) processing facility that will accept 50 tpd dry weight (or up to 600 tpd wet weight), and ship dried product for end use or disposal. Inbound material will arrive by truck. Outbound material will be transported by rail, with some truck shipment as necessary. The waste shed area and waste sources are not identified, although District member communities are specifically noted as "not expected to use the proposed facility for MSW disposal" (Draft Site Suitability Application, pg 58). NB-11

i) Glass Facility: The glass processing facility is alternately described as replacing the proponent's existing glass "beneficiation" operation from their facility at 969 Shawmut Ave, New Bedford, but is also identified as "the relocation and upgrade of the glass recycling operation that Strategic Materials previously operated in Franklin, MA to the 100 Duchaine Boulevard site. The new glass recycling facility will be owned by PPNE and will be operated in conjunction with Strategic Materials" (Draft Site Suitability Application Narrative, p. 10.). The facility is proposed to receive 200 tpd of glass bottles collected through the Massachusetts bottle deposit system for crushing, sizing and separation by color, and shipment off site for re-use or disposal. The proponent's parent company is experienced in various aspects of product destruction and container processing. NB-12

ii) MSW Facility: As described in the EENF, the MSW facility is essentially a "Dirty Material Recovery Facility (MRF)", or a mixed waste processing facility, with a goal of extracting 20% of incoming material for recycling from raw waste. Such facilities are labor-intensive and face substantial worker safety challenges. They do not require any consumer or waste hauler separation of recyclable materials from waste and have largely fallen out of favor within the waste industry, displaced by single-stream recyclables collection and processing in a "Clean MRF". Massachusetts has devoted considerable effort into educating consumers and the waste industry about recycling and has for many years tried to encourage separation and recycling at all stages of the waste generation-collection-handling-disposal processes. Waste entering a "Dirty MRF" that has already been stripped of recyclable material will likely have a very low recyclables recovery rate. Operation of the MSW facility as described does not appear consistent with the general consensus of what the future of waste handling in Massachusetts should be. The MSW tipping (or receiving) building is 50,000 square feet, which appears adequate for the proposed tonnage; the tipping floor appears best configured for direct load of waste into intermodal rail cars. It appears likely the operation will target loads specific for processing and then move those loads into the processing facility, which appears to be insufficient at 103,000 square feet, for handling 1,500 tpd of mixed waste. For comparison, the E. L. Harvey Materials Recycling Facility in Hopkinton, Massachusetts, which is permitted for 600 tpd of single-stream recyclables or mixed waste, is 80,000 square feet in size. NB-13

iii) Biosolids Processing Facility: The biosolids processing facility is expected to receive and process 50 tpd dry weight of biosolids. At the low end of the range of solids content presented in the EENF, this will actually be 600 tpd of raw material. The proposed receiving and storage facilities for the thickened and dewatered biosolids appear to be adequately sized with appropriate redundancy. The building size of 30,000 square feet may be insufficient, unless an additional upper level is included. Very little detail is provided on the design for the railcar loadout system. Additionally, there is no mention of combustion and explosion mitigation measures associated with the dried biosolids. Dried biosolids are a known explosion hazard, especially during storage. Also, the dryer does not have a standby unit, and there is no mention of the impacts to the process if one or more driers become unavailable. NB-14

c) **Energy Efficiency:** PPNE is proposing to add an additional 1.9 MW of solar power in the form of PV panels to the already 1.5 MW generated onsite. This is a net Greenhouse Gas mitigation for the project and is a good use of the sites non-programmable rooftops.

The solar power component will need to be supported through the Solar Massachusetts Renewable Target (SMART) Program, and the requested Phase 1 MEPA waiver is "*imperative*" for SMART Program support. There is no mention of contingency if SMART program support does not come through. NB-15

4) **<u>Traffic and Trip Generation</u>**

a) ***Traffic/Trip Generation:*** PPNE has included a traffic impact study which states that the facility will generate 418 new truck trips per day (209 in/out) and 150 employee trips per day (75in/out). This is a significant increase over the existing conditions of 76 vehicle trips per day. To be conservative, this includes the contingency that all outgoing material will be by truck instead of by rail. Truck traffic in tons per load and in distribution throughout the day is estimated based on data from the SEMASS facility in Rochester, Massachusetts. Traffic from the existing NWD Trucking facility on the site is deducted, as this facility is expected to relocate. NB-16

Truck estimates appear to be accurate, except that the fraction from the biosolids component appears to be somewhat low (at the low range of solids content of the incoming material, each truck as presented would carry 30 tons, which is high). Facility traffic will be present from 6:00 am to 6:00 pm Mondays through Saturdays, with the biosolids component also creating traffic on Sundays. Only a small portion of the traffic is expected to occur during peak hours (7:30 am – 8:30 am, and 3:00 pm – 4:00 pm). Seven local intersections were studied, including Philips Road, Braley Road, the Route 140 exit ramps, and intersections within the Business Park. A 2025 "Build" scenario was projected to result in only two minor reductions in Level of Service at intersections. NB-17

It is recommended that PPNE describe Transportation Demand Management (TDM) strategies in effort to reduce the impacts associated with these trips, such as carpool and vanpool preferential parking designation, working with SRTA to locate transit service accommodations, shuttle services, bicycle parking accommodations, and other options. It would further be recommended that along with a traffic analysis the proponent should provide a report on how the added vehicle traffic would impact the road conditions and add to their maintenance. NB-18

5) ***<u>Emissions, Odor, Sound</u>***

a) ***Emissions, Odor:*** PPNE analyzed emissions associated with stationary onsite combustion sources, mobile diesel equipment, dust from materials handling, and potential odor sources (biosolids, MSW). Their plan proposes to avoid, minimize, and mitigate impacts to air quality and smell through the use of best industry practices, wet scrubbing and ionization. It goes on to state that National and State Ambient Air quality standards and standards for Air Toxics will not be exceeded 'in residential areas.'

As this project is located in an industrial area, we ask that PPNE clarify air quality impacts at the facility itself, particularly for the benefit of employees of PPNE who will be exposed to this air every day as well as the nearby neighborhood. The City should be able to peer review the air quality report at the time when PPNE returns to the planning board for a Site Plan modification in order to ensure the plant employees and residential neighborhood to the east of the site is NB-19 protected from any toxics in the air.

b) ***Sound:*** PPNE analyzed sound levels associated with the proposed plant operations, taking into account sounds generated from tipping activities, fans and exhaust towers, and both indoor and outdoor activities. The project will be subject to Massachusetts State laws as administered by the DEP, which regulate noise under air pollution. The controls/mitigation include using an electric yard engine for moving rail cars within the site, employing low-noise air quality control and ventilation mechanisms such as fans and stacks, and a noise barrier wall between the biosolids cooling towers and residential area to the south. It would be recommended that the City peer review the sound assessment report at the time when PPNE returns to the planning board for a Site Plan modification in order to ensure the residential neighborhood to the east of the site is protected from excessive decibels or pure tone sounds. NB-20

6) ***Wetlands, Water Resources***

a) ***Wetlands:*** Wetland replication has not been shown on the plans. The Conservation Commission has a policy of requesting a 1 ½ to 1 ratio of wetland mitigation to wetland impacts. The wetland replication area should be constructed in an area that is currently developed or grassland such that mature upland trees in the 100' Buffer Zone do not need to be cut to facilitate the replication area. The Conservation Commission also has a policy of maintaining a 25' setback of undisturbed land between wetland resource areas and proposed development (with the exception of wetland crossings). Incursions into the 25' setback have been noted in several locations and it is hoped the plans can be redesigned to maintain an undisturbed setback. NB-21

b) **Water Resources:** It appears a portion of the new rail spur would cross through the high yield aquifer while the remaining rail siding, recycling, MSW and biosolids facilities would be within the medium yield aquifer. Long Term Pollution Prevention Plans shall be requested for each component of the facility. Spill control plans shall also be requested with respect to the diesel fuel for the rail cars and other on-site fuel facilities. The proponent should prepare a Pollution Prevention and Emergency Response plan for both the construction phase and normal operations that identifies potential contamination sources, threats of Hazardous Material and Hazardous Waste releases to the environment, describes material storage and handling details, containment and contingency plans for spill response, and documents regular inspection and employee education opportunities. Areas used for vehicle maintenance and loading docks should install a mechanical shut-off valve or other flow-arresting device between the catch basin or other stormwater-capture structure draining this area and the leaching structures. NB-22

7) **Wastewater and Stormwater**

a) ***Wastewater:*** PPNE is expected to use 13,150 GPD of water and will generate 83,125 Gallons Per Day (GPD) of wastewater (biosolids drying will be extracting water from the product). It is recommended that the proponent demonstrate through a groundwater study that the project will not have adverse impacts on groundwater levels or adjacent surface waters and wetlands. It has also recommended an infrastructure analysis be done that the proponent demonstrate the current piping and pump station is sufficient to handle the proposed new water and wastewater use. This would include the new loads impact to the wastewater treatment facility. This would determine if a pre treatment facility would be needed either on site or at the Industrial Park Pump station. The plant loadings should include nitrogen loads. NB-23

b) ***Stormwater:*** The rail siding also crosses a stormwater detention facility which was constructed under SE49-0738 to capture runoff from a construction stockpiling facility. This Order of NB-24

Conditions has expired and does not have a Certificate of Compliance. The applicant/owner shall be required to obtain a Certificate of Compliance prior to any other work commencing on site. Following this, the Notice of Intent for Phase I will have to modify the design of the stormwater facilities and stockpile area to accommodate the rail siding. Additionally, runoff from the idling MSW trucks and recycling trucks may contain trash which will enter into the stormwater system.

A plan for keeping the pavement clean and preventing the clogging of the stormwater facilities is needed. It is also of concern to the city that the plans seem to show removal of existing catch basins as well as serious increase in impervious areas. Also noted would be an explanation of how any contaminated run off from the waste areas will be dealt with.

In conclusion, in the course of the City's review it has become evident that many environmental considerations should be understood much better than they are at present and will require significant attention going forward. It is in this context that I encourage MEPA to require the proponent to issue an Environmental Impact Report. Only a continued robust program of impact analysis will put MEPA, the public, and state and local officials, in a position to decide if this particular project, at this particular location, makes sense for New Bedford, our region, and the Commonwealth. Thank you for your consideration.

Sincerely,

Jon Mitchell

CC: Energy and Environmental Affairs Secretary Matthew Beaton
Senator Mark Montigny
Representative Paul Schmid
Representative Christopher Hendricks
New Bedford Planning Board

**Czepiga, Page (EEA)**

**From:** Claudia Ostiguy <cbostiguy@gmail.com>
**Sent:** Sunday, March 31, 2019 2:18 PM
**To:** Czepiga, Page (EEA)
**Subject:** Additional Comment Period Extension

EEA No. 15990 Parallel Products of New England, New Bedford

Page Czepiga
Environmental Analyst
MEPA Office

Ms Czepaga,
I appreciate and thank you and Secretary Matthew Beaton, for the extension to accept comments expressing thoughts and concerns regarding the establishing of Parallel Products of New England in the North End of New Bedford.

It is my understanding that MEPA, establishes regulations and reviews thresholds for projects that are of a nature, size or location, likely to cause damage to the environment, directly or indirectly.

Residents from many housing developments, 2 Elementary Schools CO-1
and businesses in the actual Business Park that Parallel is joining, were stunned to learn of this invasive industry popping up, seemingly overnight, in our area.

New Bedford, has struggled for decades in its attempt to be a clean city. We are well aware of environmental challenges that impact health, and quality of life issues.

At this time, our concern is Phase I, and the final step, the Environmental Impact Report. Should this certification be granted Phaze II, which would be an even greater challenge, would begin.

Parallel's site is in the south end of the Business Park, directly across from a residential housing development with over 300

homes. (NOTE: there are many other residential sites impacted as well. )
Since Parallel has established their facility at this site, the landscape that blocked view and access to the previous businesses has been CO-2
severely altered. With the recent building of new homes that abut the Parallel property, the dense tree line and vegetation that once buffered the park and the main Street (Phillips Rd) and the housing development (Pine Hill Acres) has been reduced to a few trees.

You can see the plant.

You can see stalls filled with recyclables. You can see dozens of CO-3
vehicles including front end loaders.

You can hear the disruptive noises.

There's a faint odor detected, which will most probably get worse as the warmer weather arrives and the work load increases.

We are informed that this industry will be processing six days a CO-4
week from 6 AM - 6PM and possibly some Sundays.

This brings up not only the din from the plant, but brings up the issue of trucks, 18 wheelers in fact, which will be delivering 1,500 TONS of recyclables/MSW daily. This fleet will be taking Rte 140 South and Exit 7, Braley Road Exit, which leads into the Business Park. What you may not be aware of is that this exit, with 4 ramps, 2 on and 2 off is just West of an Elementary Magnet School. This area is already a huge logistical problem. Braley Road is impassible twice a day when the Pulaski School opens and closes. Buses, private vehicles, block the way so that Emergency Vehicles, should they be activated, have a difficult time getting through either to the Business Park or residential areas. There's also the Business Park traffic as well that adds to this frustrating problem. These tractor trailers may in all likelihood avoid Exit 7 and take Exit 5 which will have them take Phillips Road. This two lane street is not designed or able to take the load of heavy trucks and would directly travel by residential homes. Once at the plant, these trucks will sound back up bell noises, powerful engine noises and the actual sound of dumping products.

Even before this project is completed, we have lost our peace of mind. We feel disrespected and neglected. Many of us have bought homes in this bedroom community with the thought of enjoying our homes inside and outdoors. Many are retired elderly. All our hard work and sacrifices to sustain and enjoy our homes will literally be erased with noise, air pollution and traffic jams. This is just the tip of the iceberg.

We were here first! We are being invaded and taken over. It's disheartening to learn that the powers that be are supporting 50 jobs over the welfare of thousands of taxpaying citizens.

I respectfully request that at this time, you do not give EIR Certification to Parallel Products of New England in New Bedford.

Parallel must inform our community directly of their plans. Give us this time to get educated before anything else moves ahead.

Sincerely,
Claudia Ostiguy
426 Valley Road
New Bedford, MA 02745
cbostiguy@gmail.com
508-995-7613

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF
ENERGY AND ENVIRONMENTAL AFFAIRS
**DEPARTMENT OF ENERGY RESOURCES**
100 CAMBRIDGE ST., SUITE 1020
BOSTON, MA 02114
Telephone: 617-626-7300
Facsimile: 617-727-0030



29 March 2018

Matthew Beaton, Secretary
Executive Office of Energy & Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02114
Attn: MEPA Unit

RE: Parallel Products, New Bedford, Massachusetts, EENF #15990

Cc: Maggie McCarey, Director of Efficiency Programs, Department of Energy Resources
Judith Judson, Commissioner, Department of Energy Resources

Dear Secretary Beaton:

We've reviewed the Expanded Environmental Notification Form (EENF) for the above project. The proposed project consists of the following:

- 115,000-sf of lighted buildings for MSW tipping and glass processing;
- 30,000-sf of semi-heated, lighted, and ventilated building for biosolids processing.

The proponent is proposing the following improvements for GHG mitigation:

- Lighting power density reduction of 10% for all buildings;
- Heating efficiency improvement (from 85% to 90%) for biosolids processing building;
- Installation of 1.9-MW of additional solar PV.

The following requires clarification in the next submission: DOER-1

- For all buildings, clarify the planned code pathway and which two of the six C406.1 measures are being included;

- For the semi-heated biosolids processing building, provide the following:
  - Information about building construction (metal building, metal-framed, etc);
  - Envelope information (both roof and walls): R-value for insulation between studs, stud spacing, and R-value of continuous insulation;
  - Space heating output per area (btu/hr-ft$^2$).

DOER-2

Our recommendations are as follows:

1. Evaluate reducing lighting power density to 20%.
2. Evaluate using cold-climate heat pumps for space heating for the biosolids buildings.
3. Provide a schedule for installation of the planned 1.9-MW solar PV system.

Sincerely,

Paul F. Ormond, P.E.
Energy Efficiency Engineer
Massachusetts Department of Energy Resources

## Czepiga, Page (EEA)

**From:** Marlene Pollock <marlenepollock929@gmail.com>
**Sent:** Wednesday, March 27, 2019 8:32 AM
**To:** Czepiga, Page (EEA)
**Subject:** Parallel Products Project

Ms. Czepiga,
I am writing to ask you to delay any approval of this project, since it is a significant undertaking, yet there has been almost very little notice to people in New Bedford about it. I just found out about it and I am very active in the community, especially around environmental issues.

In addition, I understand that any meetings that have been held about this project have not been well publicized, MP-1
nor at times to allow people to attend. There needs to be public hearings, with effective publicity through newspapers, radio, social media, etc. to let people know about these hearings, and to schedule them with enough notice at times that people can attend.

Please delay any procedures moving toward approval of this project until the public can fully find out about it and weigh in on it, especially those whose homes abut the project directly.

Sincerely,

Marlene Pollock

--
Marlene Pollock
Organizer
Coalition for Social Justice
New Bedford & Cape Cod
508-982-8751

Learn more about CSJ's work:
https://youtu.be/scwkT1Ic6ZY?list=PLkDkZsSMuETz_2Whez0pX8R-Q0tz102x7

March 22, 2019

Mathew A. Beaton,
Secretary of Environment and Energy
Executive Office of Energy &
Environmental Affairs
100 Cambridge Street, Suite 900,
ATTN: MEPA Office,
Boston, MA 02114

RE: ENF Review EOEEA #15990
NEW BEDFORD.Parallel Products of New England (PPNE) at 100 Duchaine Boulevard

Dear Secretary Beaton,

The Southeast Regional Office of the Department of Environmental Protection (MassDEP) has reviewed the Environmental Notification Form (ENF) for the Parallel Products of New England (PPNE) Project at 100 Duchaine Boulevard, New Bedford, Massachusetts (EOEEA # 15990). The Project Proponent provides the following information for the Project:

**The Site is an industrially zoned, approximately 71-acre parcel, located within the New Bedford Business Park. The Site location and property boundaries are shown in Figure 1 using an aerial view. The Site was previously developed by Polaroid and already includes access roads, parking areas, and various buildings. Much of the existing infrastructure will be used in developing the proposed Project. New buildings will be constructed for glass processing, municipal solid waste (MSW) and construction and demolition (C&D) waste tipping, and biosolids drying.**

**PPNE is proposing to develop the Site in two phases. Phase 1 construction will consist of the construction of a glass processing building and equipment and construction of a rail sidetrack from the main line rail to the 100 Duchaine Boulevard Site. The glass processing area will consist of a 27,500 sf building to house the processing equipment.**

**Phase 2 of the Project includes the construction of a municipal solid waste (MSW) processing/handling facility and the biosolids processing facility. Currently, significant quantities of MSW and biosolids are being trucked out of state for treatment and disposal. PPNE will construct a facility to collect and process this material in Massachusetts and then ship the residual waste out of state by rail for disposal.**

**The processing proposed will also significantly increase transportation efficiencies and reduce greenhouse gas emissions. The proposed solid waste handling facility will accept up to 1,500 tons per**

**day of MSW delivered to the facility by truck. The proposed facility will process the MSW to extract recyclable material from the MSW. PPNE expects to recover and recycle approximately 20% of the MSW received, which is supports the Massachusetts solid Waste Master Plan and is state-of-the-art for the Commonwealth. The non-recyclable fraction of the MSW along with the C&D residuals/bulky waste will be then loaded in rail cars for transport to out of state disposal sites, primarily landfills.**

***Bureau of Water Resources Comments***

Wetlands Comments: The Wetlands Program has reviewed the Parallel Products LLC EENF (EEA# 15990) and offers the following comments. The Project Proponent acknowledges that work will occur within Areas Subject to Protection under M.G.L. c. 131, § 40; and that a Notice of Intent (NOI) will be filed with the New Bedford Conservation Commission and the Department. The EENF indicates that the Project will alter 4,436 square feet of Bordering Vegetated Wetland (BVW), 350 square feet of Land under Waterbodies & Waterways (LUWW), 1500 square feet of Riverfront Area, and 60 linear feet of inland Bank. The EENF states that the resource area alterations are associated with the construction of a proposed railroad spur, and that replication will be provided for the impacted BVW. The EENF also states that the impacts to BVW have been reduced by incorporating retaining walls into the crossing design to reduce the culvert length and minimize the amount of fill. The EENF does not address the potential use of a span or bridge DEP-1
design to further reduce or eliminate impacts to BVW, inland Bank and LUWW. The EENF does not indicate whether the proposed railroad spur crossing meets the stream crossing standards. The NOI should include a discussion of alternative designs for the proposed railroad spur crossing and address the stream crossing standards. The NOI should also include the Riverfront Area alternatives analysis required by 310 CMR 10.58(4)(c).

The Wetlands Protection Act Regulations for Inland Bank (310 CMR 10.54(4)(a)5.) state that a Project or Projects on a single lot, for which Notice(s) of Intent is filed on or after November 1, 1987, that (cumulatively) alter(s) up to 10% or 50 feet (whichever is less) of the length of the bank found to be significant to the protection of wildlife habitat, shall not be deemed to impair its DEP-2
capacity to provide important wildlife habitat functions. The Project proposes to alter 60 linear feet of inland Bank and therefore is required to undertake a Wildlife Habitat Analysis as part of the NOI submission. Please be aware, however, that in accordance with 310 CMR 10.54(4)(a)(6), the impact on bank caused by the installation of a stream crossing in compliance with the Massachusetts Stream Crossing Standards is exempt from the requirement to perform a wildlife habitat evaluation.

Water Management Comments. According to the ENF, it is expected that the New Bedford Water Department will supply 13,150 gallons per day (gpd) of water for this Project. New Bedford has the capacity to provide the requested volume for this Project based on its recent water use. However, DEP-3
MassDEP noticed that there was a discrepancy between the water use and wastewater generation volume presented in the ENF. MassDEP expects that the water being supplied by the New Bedford Water Department may change but New Bedford still has the ability to supply up to 83,125 gpd of water. MassDEP suggests the Proponent evaluate and implement conservation efforts that incorporate Best Management Practices (BMPs) at the Project Site. MassDEP also encourages Project Proponents that add additional demand to the public water system (PWS) to work with the PWS to mitigate the additional demands proposed by the Project.

Wastewater Comments: The City of New Bedford has an EPA approved Industrial Wastewater Pretreatment Program (IPP). The Proponent has had initial discussions with the City regarding the wastewater generated by the Project. The City and the Proponent will determine the proper monitoring, metering and pretreatment necessary to comply with the City's IPP.

Underground Injection Control Comments. The Proponent details the uses of a comprehensive stormwater management system to collect, convey, treat and control stormwater discharges associated with the Project. The Proponent should be aware that the conveyances of stormwater through underground stormwater infiltration structures are subject to the jurisdiction of the MassDEP *Underground Injection Control (UIC)* program. These structures must be registered with MassDEP UIC program through the submittal of a BRP WS-06 UIC Registration application through MassDEP's electronic filing system, eDEP. The statewide UIC program contact is Joe Cerutti, who can be reached at (617) 292-5859 or at joseph.cerutti@state.ma.us . All information regarding on-line (eDEP) UIC registration applications may be obtained at the following web page under the category "Applications & Forms": https://www.mass.gov/underground-injection-control-uic. DEP-4

Industrial Stormwater, Sector N - Recycling Facilities. Under the 2015 Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity (MSGP), Sector N (SIC code 5093) recycling centers, commonly referred to as material recovery facilities (MRF), that accept waste for sorting and distribution, including material recovery facilities that receive paper, glass, plastic, and aluminum from non-industrial sources are required to apply for industrial stormwater permit coverage.

Common requirements for coverage under an industrial stormwater permit include development of a written stormwater pollution prevention plan (SWPPP), implementation of control measures, and submittal of a request for permit coverage, usually referred to as the Notice of Intent or NOI. DEP-5

Good housekeeping is a practical, cost-effective way to maintain a clean and orderly facility to prevent potential pollution sources from coming into contact with stormwater. It includes establishing protocols to reduce the possibility of mishandling materials or equipment and training employees in good housekeeping techniques. Where feasible, minimizing exposure of potential pollutant sources to precipitation is an important control option. Minimizing exposure prevents pollutants, including debris, from coming into contact with precipitation and can reduce the need for BMPs to treat contaminated stormwater runoff. It can also prevent debris from being picked up by stormwater and carried into drains and surface waters.

BMPs must be selected and implemented to limit erosion on areas of your Site that, due to topography, activities, soils, cover, materials, or other factors are likely to experience erosion. Erosion control BMPs such as seeding, mulching, and sodding prevent soil from becoming dislodged and should be considered first. Sediment control BMPs such as silt fences, sediment ponds, and stabilized entrances trap sediment after it has eroded. Sediment control BMPs should be used to back-up erosion control BMPs. DEP-6

For additional information on Sector N of the industrial stormwater program see https://www.epa.gov/sites/production/files/2015-10/documents/sector_n_scraprecycling.pdf

***Bureau of Waste Site Cleanup Comments***

Based upon the information provided, the Bureau of Waste Site Cleanup (BWSC) searched its databases for disposal sites and release notifications that have occurred at or might impact the proposed Project area. A disposal site is a location where there has been a release to the environment of oil and/or hazardous material that is regulated under M.G.L. c. 21E, and the Massachusetts Contingency Plan [MCP – 310 CMR 40.0000].

There are no listed MCP disposal sites located at or in the vicinity of the site that would appear to impact the proposed Project area. Interested parties may view a map showing the location of BWSC disposal sites using the MassGIS data viewer (Oliver) at: http://maps.massgis.state.ma.us/map_ol/oliver.php Under "Available Data Layers" select "Regulated Areas", and then "DEP Tier Classified 21E Sites". MCP reports and the compliance status of specific disposal sites may be viewed using the BWSC Waste Sites/Reportable Release Lookup at: https://eeaonline.eea.state.ma.us/portal#!/search/wastesite

*The Project Proponent is advised that if oil and/or hazardous material are identified during the implementation of this Project, notification pursuant to the Massachusetts Contingency Plan (310 CMR 40.0000) must be made to MassDEP, if necessary. A Licensed Site Professional (LSP) should be retained to determine if notification is required and, if need be, to render appropriate opinions. The LSP may evaluate whether risk reduction measures are necessary if contamination is present. The BWSC may be contacted for guidance if questions arise regarding cleanup.* DEP-7

***Bureau of Air and Waste Comments:***

Air Quality Comments. Construction and operation activities shall not cause or contribute to a condition of air pollution due to dust, odor or noise. To determine the appropriate requirements please refer to:

- 310 CMR 7.09 Dust, Odor, Construction, and Demolition
- 310 CMR 7.10 Noise

*Construction-Related Measures.* MassDEP requests that all non-road diesel equipment rated 50 horsepower or greater meet EPA's Tier 4 emission limits, which are the most stringent emission standards currently available for off-road engines. If a piece of equipment is not available in the Tier 4 configuration, then the Proponent should use construction equipment that has been retrofitted with appropriate emissions reduction equipment. Emission reduction equipment includes EPA-verified, CARB-verified, or MassDEP-approved diesel oxidation catalysts (DOCs) or Diesel Particulate Filters (DPFs). The Proponent should maintain a list of the engines, their emission tiers, and, if applicable, the best available control technology installed on each piece of equipment on file for Departmental review. DEP-8

*Massachusetts Idling Regulation.* MassDEP reminds the Proponent that unnecessary idling (i.e., in excess of five minutes), with limited exception, is not permitted during the construction and operations phase of the Project (310 CMR 7.11). With regard to construction period activity, typical methods of reducing idling include driver training, periodic inspections by site supervisors, and posting signage. In addition, to ensure compliance with this regulation once the Project is occupied, MassDEP requests that the Proponent install permanent signs limiting idling to five minutes or less *on-site.* DEP-9

Spills Prevention. A spills contingency plan addressing prevention and management of potential releases of oil and/or hazardous materials from pre- and post-construction activities should be presented to workers at the site and enforced. The plan should include but not be limited to, refueling of machinery, storage of fuels, and potential on-site activity releases. DEP-10

Solid Waste Comments. As a result of its review of the Expanded Environmental Notification Form ("EENF") for the Parallel Products of New England Project at 100 Duchaine Blvd New Bedford ("Project" or "Site" or "facility") EEA No. 15990, the Massachusetts Department of Environmental Protection (MassDEP) Solid Waste Management Section (Solid Waste) is providing the following comments regarding solid waste permitting and the management of solid waste/recyclable and asbestos materials generated from the Project pursuant to Massachusetts Solid Waste Regulations 310 CMR 16.00: *Site Assignment Regulations For Solid Waste Facilities* and 310 CMR 19.000: *Solid Waste Management* and Asbestos Regulations 310 CMR 7.15.

*EENF Project Information:*

*The EENF denotes Parallel Products of New England (PPNE or Proponent) is proposing to develop the site in two phases. Phase 1 development consists of building a glass beneficiation operation and the construction of approximately 1.9 MW of solar power energy generation. This operation will recycle the glass containers that are collected through the Massachusetts bottle deposit system. Phase 1 construction does not trigger any MEPA review thresholds. The Phase 1 activity is included in this EENF as required by 301 CMR 11.01 (c) Segmentation.*

*PPNE is requesting a Phase 1 Waiver to allow the construction of the Phase 1 infrastructure to begin prior to the acceptance of the Single EIR required for Phase 2 construction.*

*PPNE has been operating a recycling operation at 969 Shawmut Avenue, New Bedford for the past 11 years. Since purchasing the 100 Duchaine Blvd Site in 2016, PPNE has been repairing the infrastructure at the Site to accommodate future company operations. In addition to the operations detailed in the EENF, PPNE will be moving all of its recycling operations currently located at 969 Shawmut Avenue to the 100 Duchaine Boulevard site which, in addition to glass recycling, includes aluminum and plastics container recycling. The relocation of the Shawmut Avenue operations is currently in progress and as a result operations are currently split between the two facilities. PPNE has submitted a Solid Waste permit (i.e., General Permit) for the proposed recycling operations at the Duchaine Blvd facility and is currently conducting plastics recycling at the Site.*

*Phase 2 of the Project includes the construction of a 1,500 ton per day municipal solid waste (MSW) processing/handling facility and a 50 dry tons per day biosolids processing facility. The proposed facility will process the MSW to extract recyclable material from the MSW. A processing facility will be built to dry biosolids into a Class A biosolid.*

*Additionally, the EENF states that "Demolition and construction activity at the Site will result in the generation of solid waste. The construction and demolition waste generated by the Project will be sent to licensed construction and demolition waste processers to maximize recycling of the waste materials." During the MEPA scoping session, PPNE clarified that existing structures may be renovated or demolished as part of the site development.*

*Solid Waste Comments:*
*PPNE identified the following Solid Waste permits required for each phase of the proposed Project:*

DEP-11

***Phase I:***

1. General Permit for Recycling Operations

*Phase II:*

1. Site Suitability (BWP SW-01)
2. Authorization to Construct a Large Handling Facility (BWP SW-05)
3. Authorization to Operate a Large Handling Facility (BWP SW-06)

A. Solid Waste Permitting:

PPNE submitted a **General Permit Certification** on May 11, 2018 for its glass, paper cardboard, metal and plastics recycling operations at the Site and is required to submit an "Annual Certification Statement for the General Permit pursuant to 310 CMR 16.06(1)(a)3. Refer to webpage link: https://www.mass.gov/how-to/general-permit-initial-annual-certification-recycling-composting-digestion.

The **Site Suitability Permit Application (BWP SW-01)** requires submittal of the EEA Secretary's Certificate on the ENF or EIR as appropriate. Refer to weblink: https://www.mass.gov/how-to/sw-01-38-site-suitability-report.

An **Authorization to Construct a Large handling Facility Permit Application (BWP SW-05)** may only be submitted if MassDEP issues a Decision on the Site Suitability application finding that the proposed Site is suitable for the proposed Project and the New Bedford Board of Health issues a Site Assignment for the Project property pursuant to the requirements of 310 CMR 16.00, Site Assignment Regulations for Solid Waste Facilities. Refer to weblink: https://www.mass.gov/files/documents/2016/08/uw/sw0529ap.pdf?_ga=2.260746381.1049696916.1553003081-1847519295.1541521730.

PPNE will be required to submit an **Authorization to Operate a Large Handling Facility Application (BWP SW-06)** pursuant to 310 CMR 19.029, Applicable Permit and Certification Procedures for Operation, Construction, Modification or Expansion of a Solid Waste Facility. Refer to weblink: https://www.mass.gov/how-to/sw-06-10-20-operate-an-existing-facility

B. Management of Solid Waste and Asbestos Materials from Demolition and Construction Activities

- Waste materials that are determined to be solid waste (*e.g.,* construction and demolition waste) and/or recyclable material (*e.g.,* metal, asphalt, brick, and concrete) shall be disposed, recycled, and/or otherwise handled in accordance with the Solid Waste Regulations including 310 CMR 19.017: *Waste Bans.* DEP-12

  Asphalt, brick and concrete (ABC) rubble, such as the rubble generated by the demolition of buildings or other structures must be handled in accordance with the Solid Waste regulations. These regulations allow, and MassDEP encourages, the recycling/reuse of ABC rubble. The Proponent should refer to MassDEP's Information Sheet, entitled *" Using or Processing Asphalt Pavement, Brick and Concrete Rubble, Updated February 27, 2017 "*, that answers commonly asked questions about ABC rubble and identifies the provisions of the solid waste regulations that pertain to recycling/reusing ABC rubble. This policy can be found on-line at the MassDEP website: https://www.mass.gov/files/documents/2018/03/19/abc-rubble.pdf

- Demolition and Asbestos Containing Waste Material: The proposed Project includes the demolition of structures which may contain asbestos. The Project Proponent is advised that demolition activity must comply with both Solid Waste and Air Quality Control regulations. DEP-13

Please note that MassDEP promulgated revised Asbestos Regulations (310 CMR 7.15) that became effective on June 20, 2014. The new regulations contain requirements to conduct a pre-demolition/renovation asbestos survey by a licensed asbestos inspector and post abatement visual inspections by a licensed asbestos Project monitor. The Massachusetts Department of Labor and Work Force Development, Division of Labor Standards (DLS) is the agency responsible for licensing and regulating all asbestos abatement contractors, designers, Project monitors, inspectors and analytical laboratories in the state of Massachusetts.

In accordance with the revised Asbestos Regulations at **310 CMR 7.15(4),** any owner or operator of a facility or facility component that contains suspect asbestos containing material (ACM) shall, prior to conducting any demolition or renovation, employ a DLS licensed asbestos inspector to thoroughly inspect the facility or facility component, to identify the presence, location and quantity of any ACM or suspect ACM and to prepare a written asbestos survey report. As part of the asbestos survey, samples must be taken of all suspect asbestos containing building materials and sent to a DLS certified laboratory for analysis, using USEPA approved analytical methods.

If ACM is identified in the asbestos survey, the Proponent must hire a DLS licensed asbestos abatement contractor to remove and dispose of any asbestos containing material(s) from the facility or facility component in accordance with **310 CMR 7.15**, prior to conducting any demolition or renovation activities. The removal and handling of asbestos from the facility or facility components must adhere to the Specific Asbestos Abatement Work Practice Standards required at **310 CMR 7.15(7)**. The Proponent and asbestos contractor will be responsible for submitting an ***Asbestos Notification Form ANF-001*** to MassDEP at least ten (10) working days prior to beginning any removal of the asbestos containing materials as specified at **310 CMR 7.15(6).**

The Proponent shall ensure that all asbestos containing waste material from any asbestos abatement activity is properly stored and disposed of at a landfill approved to accept such material in accordance with **310 CMR 7.15 (17).** The Solid Waste Regulations at **310 CMR 19.061(3)** lists the requirements for any solid waste facility handling or disposing of asbestos waste. Pursuant to **310 CMR 19.061(3) (b) 1,** no asbestos containing material; including VAT, asphaltic-asbestos felts or shingles; may be disposed at a solid waste combustion facility.

C. Suitability Criteria:

- The Water Resources Map submitted within the Draft Site Suitability Report appears to indicate that riverfront area lies within the proposed waste handling area. The Proponent should review the requirements of 310 CMR 16.40(3)(d)(6) and consider modifying the proposed waste handling area. DEP-14

- Figure 6-1 of the Sound Level Assessment Report depicts new residential dwellings southeast of the Site on the western side of Phillips Road. The new residential dwellings are not identified in Appendix A Insert 3 Land Use Plan. It is unclear if these dwellings are located within 500 feet of the waste handling area. DEP-15

  It appears that the Proponent's Sound Level Assessment Report has not considered all potential sound sources from proposed facility operations. Pursuant to 310 CMR 7.00 Air Pollution Control Section 7.10: U Noise, MassDEP regulates all sounds emanating from a solid waste facility operation including the operation of: waste handling equipment inside and outside the building; waste delivery vehicles on-Site inside and outside the building; and fixed mechanical equipment. Potential sound sources include both the movement of waste handling equipment and the sound produced during materials loading, unloading and transfer.

- The Site borders the Acushnet Cedar Swamp State Reservation. The EENF states "the siting of the Facility will not have an adverse impact on the physical environment of, or on the use and enjoyment of, state or municipal parklands or conservation land, or other open space held for natural resource purposes" however they did not offer any explanation or mitigating factors to support their claim. DEP-16

- Proponent should provide a detailed description of the movement of empty and full railcars for the Site including the five new rail spurs within the proposed Site assigned area and the extended sidetrack along the western property boundary adjacent to the existing rail line. The Department recommends that the Proponent provide this information in the SEIR. DEP-17

- Traffic Impact Study. The Traffic Impact Study performed by McMahon Associates indicates that two study intersections will operate at a traffic volume greater than their capacity for some turning movements and that one intersection has a crash ratio higher than the statewide and District 5 average. The Proponent has not proposed or recommended any mitigation. The Proponent should discuss these intersections with the roadway overseeing agency, MassDOT or the City of New Bedford as appropriate, regarding the necessity for and development of mitigation measures. DEP-18

  The Proponent presented assumptions regarding the distribution incoming waste volume by vehicle capacity, which directly affected the predicted Project related traffic volume. The Proponent is advised that, during MassDEP permitting, the Proponent must commit to limiting the maximum number of vehicles utilizing the site to that presented in the traffic study, or the Proponent must revise the traffic study to reflect the maximum proposed Site traffic flow rate.

If you have any questions regarding the Solid Waste Management Program comments above, please contact Mark Dakers at (508) 946-2847 or Cynthia Baran at (508) 946-2887.

BAW Business Compliance and Recycling Comments: Massachusetts and the New England Region have had a difficult time finding outlets for recycling container glass after the Ardagh Glass plant (Milford, MA) closed in early 2018. The result has been a significant price swing driving costs up for municipal recycling programs. MassDEP has been actively trying to identify and support new markets for container glass working with municipalities and recycling businesses. The Parallel Products of New England, Inc. Phase I project will enhance glass processing in the region offering alternative markets for those collecting and diverting container glass from disposal. Parallel Products extensive background in handling, processing and marketing recycled container glass will increase competition in a currently oversupplied market resulting in lower costs for those entities looking to recycle the material.

***Environmental Justice Comments:***
After reviewing relevant Environmental Justice analyses presented in the Expanded ENF, MassDEP offers the following comments.

As stated in the report the city of New Bedford is an environmental justice community meeting all three criteria (M/I/E) with 69.6% or 66,180 residents residing in an EJ block group. The total population of the city of New Bedford based on the 2010 U.S. Census is 95,072.[1]

The Expanded ENF states that the proposed PPNE Project exceeds the MEPA threshold for new solid waste processing capacity of 150 or more tons per day, and the wastewater mandatory threshold of 150 or more of sewage sludge, triggering the requirement for filing an Environmental Notification Form and a mandatory Environmental Impact Report. Pursuant to the 2017 EEA EJ Policy any Project that exceeds the ENF thresholds for solid waste or wastewater and involves a Project Site located within one mile of an EJ population will be required to implement enhanced public participation under MEPA. The proposed outreach as written in the report meets some of the requirements in the EJ Policy. However MassDEP recommends the following additional outreach tools listed below: DEP-19

- Non-Traditional Information Repositories (houses of worship, community centers, along with the traditional repositories – libraries, government offices)
- Contact EJ Community Leaders
- Ensure notice to the community prior to and during the public meeting and permitting process to ensure the community has opportunities to get involved.

Many EJ populations are located in densely populated urban neighborhoods, in and around the state's oldest industrial sites (i.e., New Bedford) while some are located in suburban and rural communities. These high –minority, low income neighborhoods are host to or are in close proximity to many of the states contaminated and abandoned sites, regulated facilities and sources of pollution.

The Environmental Justice Areas Criteria by Block Group map (Figure 3 in the Expanded ENF) indicates that there are two daycares and one school located within the one-mile buffer zone of the Site and another school located just outside of the one-mile buffer zone. It is noted in the report using MassDPH's Environmental Public Health Tracker that New Bedford has statistically higher rates of environmentally-related health outcomes including but not limited to pediatric asthma, COPD, asthma related ED visits. The close proximity of the school and daycares to the Project site and the Project's potential increase in truck traffic, air pollution (emissions) and potential noise and odor pollution raises a concern of the potential impact, to these vulnerable populations (children and the elderly). Potential Project-related impacts to these populations should be discussed in the EIR and addressed during this permitting process.

Additionally, MassDEP recommends that Project-related air pollution and environmental impact information be shared with EJ communities in alternative format (translation, interpreter services) if applicable. This information should be provided using terms that are easily understood in an effort to ensure the community understands the Project, its potential impacts, and can provide meaningful input.

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[1] Data provided by the 2010 Unites States Census – American Fact Finder at https://factfinder.census.gov/faces/nav/jsf/pages/community_factsxhtml.

***Proposed s.61 Findings***
The "Certificate of the Secretary of Energy and Environmental Affairs on the Environmental Notification Form" may indicate that this Project requires further MEPA review and the preparation of an Environmental Impact Report. Pursuant to MEPA Regulations 301 CMR 11.12(5)(d), the Proponent will prepare Proposed Section 61 Findings to be included in the EIR in a separate chapter updating and summarizing proposed mitigation measures. In accordance with 301 CMR 11.07(6)(k), this chapter should also include separate updated draft Section 61 Findings for each State agency that will issue permits for the Project. The draft Section 61 Findings should contain clear commitments to implement mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and contain a schedule for implementation. DEP-20

***Other Comments/Guidance***
MassDEP supports the Proponents request for the Secretary to grant a Phase I waiver.

The MassDEP Southeast Regional Office appreciates the opportunity to comment on this proposed Project. If you have any questions regarding these comments, please contact George Zoto at (508) 946-2820.

Very truly yours,

Jonathan E. Hobill,
Regional Engineer,
Bureau of Water Resources

JH/GZ

Cc: DEP/SERO

ATTN: Millie Garcia-Serrano, Regional Director and Acting BAW Deputy Regional Director
David Johnston, Deputy Regional Director, BWR
Gerard Martin, Deputy Regional Director, BWSC
Jennifer Viveiros, Deputy Regional Director, ADMIN
Jim Mahala, Chief, Wetlands and Waterways, BWR
Holly Johnson, Assistant Director for Operations and Special Projects/Boston
Deneen M. Simpson, Environmental Justice Director & Program Manager/Boston
Greg Cooper, Deputy Director - Consumer Programs/Boston
Daniel Gilmore, Wetlands and Waterways, BWR
Mark Dakers, Chief, Solid Waste, BAW
Alison Cochrane, Solid Waste, BAW
Douglas Coppi, Solid Waste, BAW
Daniel Connick, Solid Waste, BAW
Duane LeVangie, Chief, Water Management Act, BWR/Boston
Shi Chen, Water Management Act, BWR/Boston
Joseph Cerutti, Underground Injection Control Program, BWR/Boston
Allen Hemberger, Site Management, BWSC

## Czepiga, Page (EEA)

**From:** Gilmore, Daniel (DEP)
**Sent:** Friday, April 05, 2019 9:42 AM
**To:** Czepiga, Page (EEA); Mahala, Jim (DEP)
**Cc:** Zoto, George (DEP); Hobill, Jonathan (DEP)
**Subject:** RE: Response to MassDEP comments

Hi Page,

The response letter addresses the alternative designs for the proposed crossing. That information should be clearly and concisely included in the NOI. The response states the stream crossing will be designed in accordance with the Stream Crossing Standards. The NOI plans should clearly demonstrate the design meets the standards. The response letter states that the Riverfront Area in New Bedford is only 25 feet which is accurate. However, I believe that the alternatives analysis should be augmented when the NOI is filed. If the proponent is contending that the site is previously developed or degraded and that the project is a Redevelopment Project, then the NOI should include information on how the proposal will meet the requirements of 310 CMR 10.58(5). DEP-21

Dan

Daniel F. Gilmore
MassDEP Wetlands & Waterways Program
Southeast Regional Office
20 Riverside Drive
Lakeville, Massachusetts 02347

Telephone: 508-946-2808
FAX: 508-947-6557

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, MassDOT Secretary & CEO

massDOT
Massachusetts Department of Transportation

March 29, 2019

Matthew Beaton, Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114-2150

RE: New Bedford – Parallel Products of New England, Inc. - EENF
(EEA #15990)

ATTN: MEPA Unit
Page Czepiga

Dear Secretary Beaton:

On behalf of the Massachusetts Department of Transportation, I am submitting comments regarding the proposed Parallel Products of New England, Inc project in New Bedford, as prepared by the Office of Transportation Planning. If you have any questions regarding these comments, please contact J. Lionel Lucien, P.E., Manager of the Public/Private Development Unit, at (857) 368-8862.

Sincerely,

Robert Le Fay /FOR

David J. Mohler
Executive Director
Office of Transportation Planning

DJM/jll

Ten Park Plaza, Suite 4150, Boston, MA 02116
Tel: 857-368-4636, TTY: 857-368-0655
www.mass.gov/massdot

cc: Jonathan Gulliver, Administrator, Highway Division
Astrid Glynn, Administrator, Rail and Transit
Patricia Leavenworth, P.E., Chief Engineer, Highway Division
Mary-Joe Perry, District 5 Highway Director
Neil Boudreau, Assistant Administrator of Traffic and Safety Engineering
Planning Department, City of New Bedford
Southeastern Regional Transit Authority
Southeast Regional Planning and Economic Development District
PPDU Files

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, MassDOT Secretary & CEO

massDOT
Massachusetts Department of Transportation

**MEMORANDUM**

TO: David Mohler, Executive Director
Office of Transportation Planning

FROM: J. Lionel Lucien, P.E, Manager
Public/Private Development Unit

DATE: March 29, 2019

RE: New Bedford: Parallel Products of New England – EENF
(EEA #15990)

The Public/Private Development Unit (PPDU) has reviewed the Expanded Environmental Notification Form (EENF) for the Parallel Products of New England, Inc. project in New Bedford. The project entails the construction of a solid waste facility to process municipal solid waste (MSW) and construction and demolition (C&D) of materials. The existing site consists of the NWD Trucking facility located at 100 Duchaine Boulevard and is bounded by a CSX rail line to the east, Phillips Road to the west, industrial properties to the north and undeveloped land to the south. The project is expected to be built over time in two phases. Phase I development consists of building a glass Beneficiation operation and the construction of approximately 1.9 MW of solar power energy generation. Phase II entails the construction of a MSW transfer station and biosolids drying facility. Phase II is expected to be constructed approximately two years after the construction of Phase I.

The project is expected to generate approximately 418 new truck trips per day (209 truck trips entering, 209 truck trips existing) based on empirical data collected from a similar solid waste facility operations. In addition, employees will contribute approximately 150 vehicle trips (75 entering, 75 exiting) for a total of 568 vehicle trips accessing the site on an average weekday.

The project does not exceed any transportation thresholds but exceeds MEPA thresholds for wastewater and solid waste and therefore is required to prepare an Environment Impact Report (EIR). The Proponent has requested a waiver to proceed with the construction of Phase I, pending the completion of the Environment Impact Report (EIR) for the project.

The project does not require a Vehicular Access Permit from MassDOT but has applied for an Industrial Rail Access Program (IRAP) grant in the amount of $500,000. The grant will be used for the construction of a rail side track along the CSX Transportation line to meet the needs of the glass processing facilities as part of Phase I. The rail side will be expanded in Phase II to meet the needs for transport of solid waste. The Proponent will use the rail side for the outbound shipment of MSW, glass and dried biosolids.

The facility, when at full capacity, expects to ship 1200 tons per day (tpd) of MSW residuals, 50 tpd of dried biosolids and 250 tpd of glass. The rail side track at full operations could reduce by up to 110 the number of truck trips in and out of the site.

The EENF includes a Transportation Impact Assessment (TIA) that includes an evaluation of the study area transportation network and presents an analysis of existing and future build conditions for each intersection. The TIA is in general conformance with MassDOT/EOEEA Guidelines for *EIR/EIS Traffic Impact Assessment.*

Study Area

The study locations for which traffic analyses were conducted are as follows:

- Route 140 Northbound on/off Ramps/Braley Road intersection;
- Route 140 Southbound on/off Ramps/Braley Road intersection;
- Braley Road/Theodore Rice Boulevard at Phillip Road intersection;
- Theodore Rice Boulevard/Duchaine Road intersection;
- Duchaine Boulevard/Samuel Barner Boulevard intersection;
- Phillips Road/Samuel Barner Boulevard intersection; and
- Duchaine Boulevard/Site Driveway intersection.

The study area is adequate for capturing the traffic impacts of this development.

Trip Distribution

The project trip distribution on the study area network was based on expected access to/from Route 140. The majority of traffic entering the site is expected to use Route 140 to Braley Road with a small portion of traffic coming from the site expected to use Phillips Road to access the proposed site.

Safety

Crash rates for the study area intersection were calculated using MassDOT data for the five-year period from 2011-2015. Based on the data, the crash rates for all study area intersections are below the state and district averages for signalized intersection. Two unsignalized intersections are experienced crash rates slightly higher than the state and district averages. The additional traffic volumes associated with the project is not expected to significantly impact safety at these intersections. There are no Highway Safety Improvement Program (HSIP) high crash cluster intersections in the study area.

Traffic Operations

Capacity analyses were conducted for the weekday AM and PM peak hours for 2018 Existing, 2025 No-Build, and 2025 Build (full build) conditions, for the study area intersections.

In the 2025 No-Build, traffic operating conditions at most intersections are expected to experience no significant changes, except for one approach movement where level of service will worsen from B to C. Likewise, 2025 Build conditions experience slightly increased delays compared to the 2025 No-Build conditions, but the delays were not significant enough to impact LOS in most cases.

Parking

The project will provide 428 parking spaces to accommodate both trucks and employees on site. The proposed number of parking spaces is a reduction from the current number of existing parking spaces.

Multimodal Access and Facilities

Despite the proposed land use primarily oriented towards truck traffic, the Proponent should seek the opportunity to provide multimodal accommodations to access the site. The roadway network in the vicinity of the site provide sufficient shoulder widths to encourage bicycle travel. We note that the Southeastern Regional Transit Authority (SRTA) provides bus service along Duchaine Boulevard and Phillips Road, with bus stops located within walking distance to the site along Duchaine Boulevard and at the intersection of Phillips Road with Heritage Court. Pedestrian accommodations exist along Phillips Boulevard. We encourage the Proponent to design their site drive in accordance to Complete Streets standards to facilitate opportunities to walk and bike to the site. DOT-1

Transportation Demand Management Program

The Proponent should develop a Transportation Demand Management (TDM) program aimed at reducing site trip generation. MassDOT understands that the project primarily generate truck traffic; nevertheless, the following TDM measures are recommended with the goal of reducing vehicle trips by employees of the development: DOT-2

- Offer direct deposit for payroll transactions;
- Implement off-peak shift start/end times for employees;
- Provide preferential parking for carpools and vanpools;
- Offer onsite employee services such as a cafeteria.
- Provide information on transit options as a mean of travel to the site.

MassDOT does not object to the Proponent's request for a Phase I waiver for the project. The proponent should address the details of the above comments in the SEIR and submit a copy of the MEPA Certificate for this project as part of their grant application for the IRAP funding. If you have any questions regarding these comments, please contact me at (857) 368-8862.

Secretary of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston Ma.02114
Attn: Page Czepiga, MEPA

Parallel Products of New England, LLC
file No. 15990

Dear MEPA Officials, my wife and I are 52 yr residents of a residential area that is located within a few hundred feet of the property of the proposed project. I have read the Expanded Environmental Notification report submitted by Green Seal Environmental Inc. on behalf of the petitioner.

I understand that the petitioner is requesting 1. waiver to begin immediate construction on a portion of the Phase1, glass recycling facility before submittal or receipt of permits of approval, 2. approval of the environmental permit for the complete construction and operation of Phase 1., and 3. the approval and permits for future construction and operation of a regional Municipal Solid Waste Plant and Bio-solids Drying facility. Some construction has already begun on Phase 1 as noted in the report and is readily observable at the site today.

It appears to me that the report is incomplete as it does not present enough information For MEPA to evaluate the requirements for site suitability as stated in 310CMR 16.40 which requires a 500 Foot clearance for the proposed facility from occupied residences. The map shown on report insert 3A obtained from the city of New Bedford published in 2015 shows that 500 Foot clearance from the facility property boundary encompasses 44 houses east of Phillips Rd. and another 6 that have been built since, on the west side of Phillips Rd. south of the facility. While some may argue that the operation of the facility will not occur on the facility boundary line, the access roads into the glass delivery area of the site are close enough to the eastern edge of the property boundary to still encompass at least half of the houses identified above. RL-1

These issues are affected by the infringement of the 500 foot clearance requirement. One is noise. Second is dust. Third is odor. RL-2

## NOISE

RL-3

In Phase 1., noise will be generated by truck traffic at the glass handling facility, and by the front end loaders that move the open dumping of glass into the glass crushing and classification building, as well as the unloading of the processed glass to trucks, and the movement of rail cars (future). The traffic study projected 108 trucks per day for the glass plant which drops to 54 once the rail is operational shown Appendix E of the Trip Generation study.

A noise analysis and evaluation was conducted. It included baseline measurements in 4 receptor locations: at the southeast property line and three locations east and north east at or near the residences. Modeling was used to project upon the baseline noise the additive effect of the proposed facility operation. Results showed a 3 to 8 Db rise in noise at some of the receptor locations. Equipment similar to that proposed for the facility were used together with noise studies done in other waste handling sites together with assumptions, stated that the10 Db criteria will be met.

Now, the nature of the noisiest part of the proposed plant occurs in the receipt and handling in the glass in Phase 1. which is located on the east side of the property, the area closest to the residences. Noise is generated by trucks dumping on the pavement, followed by the scraping of a front end loader bucket. This operation occurs in an open area covered only with a roof canopy to house the solar panels.

Two operating issues arise; 1. the sporadic and frequent nature of the 'bang and clank' equipment that may continue as late as 10Pm, 2. the probable magnification and echo effect of this noise generated in the canyon where this unloading operation takes place, which is about 30' below the residences east of Phillips Rd. AND inside the 500' clearance requirement.

When these two issue are taken into account, it is questionable that the modeling predictions of noise at the residences affected are within the 10Db requirements. Additionally the unloading operation noise is not steady but sporadic; composed of frequently variable sound changing in pitch and frequency, which increases its annoyance to the human ear. It is easier to fall asleep to a quiet bedroom fan than to a noisy party outside your bedroom window.

## DUST RL-4

Dust will be generated by all phases of the proposed facility, dust that is now not present in our neighborhood. About 50% of the winds in our area blow from the southwestern to the western sector, which will carry dust and aerosols north and mostly east into the nearby residences. Mitigation strategies have been proposed that include housing the Phase 2 operations inside buildings. However, the Phase 1. truck unloading and reloading of glass and front end loading does not take place inside a building.

It is probable that some of this dust will be blown into the nearby residences as a nuisance, falling on parked automobiles, drying clothes, open decks, swimming pools, and outdoor play equipment. Even if the analysis show that no air quality requirements are breached, other mitigation efforts should be done to minimize this nuisance. Likely, spillage from glass carrying dump trucks along the eastern boundary access and egress roadway will generate unmitigated additional dust.

## ODOR RL-5

An analysis of odor was submitted with the report which stated that odor is mostly a subjective measure. One human's nose may be more sensitive than another nose, and as such, a proxy metric has been used to evaluated the impact of odor. Dilution of the odorous air with equal or multiple volumes of air are the criteria used. Highly odorous emissions need up to 5 volumes of air as opposed to only one volume for slightly odorous emissions, according to the science presented, to reach an acceptable level. Some mitigation is offered for the emissions of the proposed bio-solids drying plant with a scrubber.

Questions arise about whether this strategy, or analysis is adequate, given that the noxious odors travel the same ambient wind currents that move the dust from the site to the residences. Will the bio_solids drying plant shut down when the scrubber is not in service? As a frequent user of the recycle facility at Shawmut Ave. in New Bedford, I can personally attest to the noxious and pungent odor emanating from the simple off loading of sludge waste water trailers discharging into underground tanks. This odor permeates the entire recycle area.

Keeping in mind that the proposed bio-solids facility is on the property that is not 500 ' from the residences and that it is proposed as a regional facility to operate 24 hours a day, it is questionable that the nearby residences will avoid receiving objectionable odors.

RL-6

## ENVIRONMENTAL JUSTICE

In order to protect the minority and under served population, an analysis of environmental justice is presented in the report . It focused on the health statistics of the New Bedford population as compared to the surrounding towns. The results showed that New Bedford has statistically higher incidences of cancer, heart disease, COPD and asthma than do either the state average or the surrounding towns. Both environmental and lifestyle factors are postulated as the reason for New Bedford's higher than average disease rate.

When an additional burden of noise, dust and odor is imposed on a community with compromised health to begin with, it is questionable that the minor benefit of a few new jobs of the proposed regional facility outweighs the health costs borne by its citizens. As shown in the preceding discussion, the 500' clearance requirement, has approximately 100 homes whose occupants are exposed to the environmental impacts of the proposed facility.

## SITE HISTORY AND COURT CHALLENGE

Although not included in the report, it is instructional to know about the history of the site and adjacent areas. Thee building directly west of the site now owned by Eversource, was formally a film winding facility. Originally it was owned by the bankrupt Polaroid Corp. until the late 90"s. Later owned by another firm for the same purpose.

In 1990 a developer proposed to locate a 250Mw coal fired power plant about ½ mile west of the present Eversource building to serve the Polaroid plant and to sell the extra capacity to the electric utility. A construction permit was issued by MEPA over the objections of the local GNB-NO-COAL group of citizens and the Massachusetts Attorney Generals Office.

The Massachusetts Supreme Court rescinded the permit based on lack of need. The developer appealed the Court decision and reapplied for the permit. Again both GNB-NO-COAL, and the Attorney Generals Office objected to the issuance of the permit for the same reason. About 4 years passed since the permit was first requested. While preparing for another trip to the Supreme Court, the developer withdrew his application for the permit. As it turned out, the Polaroid Corporation went bankrupt and the electric utility was able to meet the electrical system demand without the unneeded Coal Fired power plant.

RL-7

## PRESENT SITE ACTUAL CONDITIONS

On March 17, 2019 I walked around most of the Eastern portions of the site in order to compare the maps presented in the report to the actual existing conditions. A large pile of crushed glass has already been stored under the north open canopy at the south eastern corner of the site. The pile occupies the entire area of the 100' by 275'area with heights from 6' to 12' in height. Using conservative estimates of 75lb/ft3 and a median height of 9',the pile contains approximately 9000 tons of crushed glass. A photo is attached. Solar panels are in operation on the roof of this canopy as well as the identical south canopy about 70' away. No glass is currently stored under the south canopy.

The open space between the canopy storage areas is not shown on the maps C1, C2 and C2A but appear as parking lots. In order to move the pile to another facility or through the future proposed glass processing facility over 750,12 yd trucks are needed or an even greater number of front end loader trips . These operations are not described in the report. Additionally, the need to provide glass storage in the future is likely due to outages that interrupt operations in the processing building. This adds noise and dust beyond what is reported.

Presently there is some demolition and other activity around the area of the proposed glass processing building during the week which I can hear from the outside of my house. Has approval been given for this storage and construction before the public comment period is over?

## RECOMMENDATIONS

1. All MEPA officials responsible for approving this proposed regional waste handling project need to visit the site and the surrounding residential areas. This licensing process is more about minimizing the impact on the community than on protecting the environment. Since 100 residences are within 500', as shown in the report, of the site boundary and are 30' above the site, residents have visual impact in addition to the environmental ones reported using projections, modeling and assumptions. When at the site, ask yourself honestly, would you buy any of the houses presently for sale on the west side of Phillips Rd. south of the site? I would appreciate being invited for any planned site visit. RL-8

2. Phase 1 is separable and distinct from Phase 2. Set aside the permitting process for Phase2. Delay MSW and Bio-solids drying portion, which have Air quality requirements of Phase2, until there is a demonstrated need. Does Parallel Products have signed contracts for the waste deliveries ? The report states that the city of New Bedford does not plan to use this proposed regional MSW & Bio-solids facility. The need for the proposed regional MSW and Bio-solids waste handling facility is questionable since the petitioner does not have a firm construction schedule. As was the case in the history of the proposed unneeded Coal-fired power plant, a large capacity regional facility is proposed to enhance economic viability for owners at odds with residence concerns. RL-9

3. Delay the waiver to construct the regional glass processing facility. Address the site suitability requirements which were stated to be preliminary until the air quality permit was received. No waiver was requested for relief from the 500' clearance required between the site and occupied houses by Massachusetts law.310CMR16.40 RL-10

Early construction before permit receipt was requested so that the petitioner could receive approval to construct solar power qualified under the new SMART incentive program. According to the list of applicants to this program dated March 15, 2019, application nos. 65 and 68 for a total of 1.346Mw have already been approved. My site visit confirmed that the largest part of the solar power associated with Phase 1 is in service. The Solar Power is no longer an issue when Phase 1, is separated from Phase 2. RL-11

Closure of existing glass processing facilities in Massachusetts that received glass from recycling centers was stated as another reason that immediate construction approval was requested to avoid the longer haul to other facilities much further away. It is evident considerable storage of crushed glass now exists on the proposed site and should not be used as pressure for MEPA to approve the facility. The petitioner has other options that may be costly, but it is not the responsibility of MEPA to protect the petitioner's profit, poor planning or business model

## FINALLY

In closing, I pray that MEPA would not place proposed large regional projects higher in value than local concerns which impacts its citizens. I see the purpose of respecting the environment, codified in numerous laws and requirements, as important to protect the humans living on the planet from harmful competing interests. A peaceful and pleasant residential neighborhood environment is a treasure. Unfortunately there are no scientific metrics to establish its worth when only the environment is measured.

It is interesting to note that Massachusetts has the oldest State Constitution. Together with the National Constitution, these documents stem from the individual rights of the people to life, liberty and the pursuit of happiness and authorize the Government to protect these rights by establishing just laws. Our Judiciary system is established not only to judge if laws are breached but to test that the laws are just.

MEPA, as an executive agency, can and should take a reasoned approach in this instance to judge the merit of this petition before you; and to exercise its authority to benefit the citizens of Massachusetts.

ATTACHMENTS

1. Older satellite image of proposed site showing adjacent residential area east of Phillips Rd. Note the blue 500'scale at the lower right of the image and the houses along Ridgewood Road. The south eastern part of the site appears as a parking lot, which it is today, with a canopy over the lots and solar panels on the roof. Not shown in this image are the 8 houses built on the west side of Phillips rd. One house is less than 100 feet from the south east bend on the access road, which remains unsold nearly one year after completion. RL-12

2. 9000 ton crushed glass pile taken 3-17-2019, located under the northern part of the southern lot.

Respectfully,

Robert H. Ladino 3-18-19

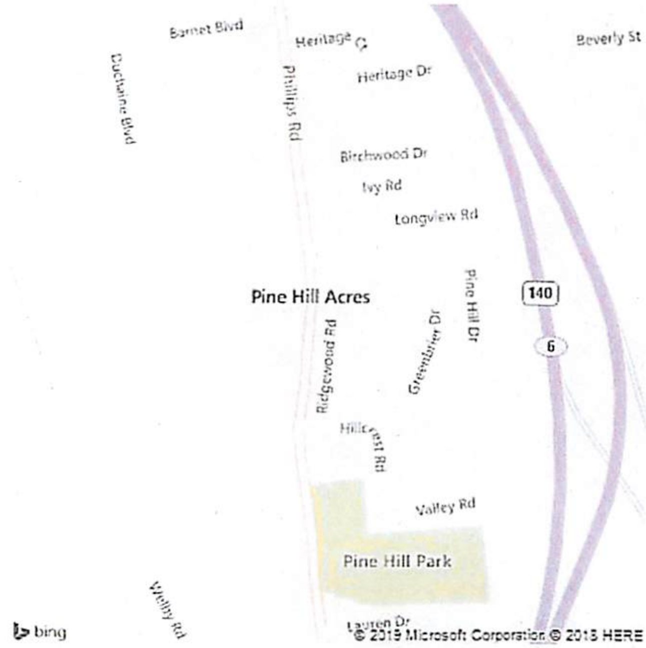
Robert H. Ladino
bobladino@comcast.net
508-269-9120

bing maps

ATTACHMENT NO. 1

Notes

old satellite image





ATTACHMENT NO.2

## Czepiga, Page (EEA)

**From:** Roger A. Cabral <rogercabral@comcast.net>
**Sent:** Tuesday, March 26, 2019 7:05 PM
**To:** Czepiga, Page (EEA)
**Subject:** Parallel Products / New Bedford industrial Park

RC1-1

I just learned of this project which is proposed for the New Bedford Industrial Park. I'm very concerned by the fact that this project has not received a lot of attention and that many of the neighbors are unaware of what is proposed. Given the nature of this proposed project I think that a WELL PUBLICIZED public meeting is appropriate. I also think that all neighbors within a mile of the site should be notified by mail about the meeting. I believe that the New Bedford Industrial Park is the wrong place for a business of this nature.

Roger A. Cabral
9 Bow Drive
Acushnet, MA
508-642-9173

## Czepiga, Page (EEA)

**From:** Ron <rrcrt@aol.com>
**Sent:** Tuesday, April 02, 2019 6:09 PM
**To:** cstrupczewski@verizon.net; Czepiga, Page (EEA)
**Cc:** cbostiguy@gmail.com; ritalapre@gmail.com; brad.markey@newbedford-ma.gov; desk@wpri.com; kjohnston@abc6.com; 5investigates@wcvb.com; antonio.cabral@mahouse.gov; chris.hendricks@mahouse.gov; christopher.markey@mahouse.gov; paul.schmid@mahouse.gov; william.straus@mahouse.gov; Ian.Abreu@newbedford-ma.gov; Naomi.Carney@newbedford-ma.gov; Debora.Coelho@newbedford-ma.gov; Hugh.Dunn@newbedford-ma.gov; Brian.Gomes@newbedford-ma.gov; Dana.Rebeiro@newbedford-ma.gov; Linda.Morad@newbedford-ma.gov; Joseph.Lopes@newbedford-ma.gov; Maria.Giesta@newbedford-ma.gov; Scott.Lima@newbedford-ma.gov; Jon.Mitchell@newbedford-ma.gov
**Subject:** Re: EEA15990 Paralles Products - New Bedford Business Park

***It is my understanding that Secretary Matthew Beaton has allowed residents till April 05, 2019 to write their opposition for Parallel Products, Inc. of New England for its expansion in the New Bedford Business Park and also their considering of adding a Wastewater Sludge Facility.***

***I reside in the Briarwood development which there are approximately 300 homes, there are two entrances from Braley Road into Briarwood and two exits from Briarwood onto Braley Road, Braley Road is a highly used thoroughfare going to and from Route 140, Acushnet Avenue and Phillips Road.***

***In the mornings starting at 7 AM we have a traffic problem on Braley Road with school buses, vehicles, parents dropping their children off for school at the Pulaski School, vehicles parked on both sides of Braley Road. It is a problem exiting from Briarwood onto Braley Road.*** RC2-1

***We have two large nursing homes and the VIBRA Hospital of S.E. MA in the Sassaquin area throughout the day ambulances are going back and forth, we have a Fire Station on Acushnet Avenue south of Braley Road. These emergency vehicles are always using Braley Road because of Route 140.*** RC2-2

***There will be a problem at Parallel Products, Inc we will have with garbage trucks and trailer trucks coming off of route 140 North and South bound it will be a nightmare, traffic will be backed up on Rt 140 North and South bound exit 7 as vehicles, garbage trucks, and 18 wheeler's are trying to exit off the highway onto Braley Road on the way to the Parallel Products Inc property, then they will be returning back to Route 140.*** RC2-3

***There will be Garbage trucks and 18 wheeler's to avoid the traffic jam off of exit 7 North bound they will use exit 5, they will proceed north on Phillips Road to enter the unnamed road of the New Bedford Business Park, south of Braley Road entrance closer to the Parallel Products, Inc property, this will now cause another traffic jam.*** RC2-4

***The study evaluated traffic impacts based on 284 inbound trips and 284 outbound trips (trucks carrying material and employee trips traveling to and from work). This is on Route 140 North and South as well as our streets leading to the Industrial Park.***

*I would not be surprise if fatalities could occur because of the numerous amount of garbage trucks and trailer trucks coming off of Rt 140 North and South bound onto Braley Road from 6 AM to 6 PM Monday to Saturday, and possibly on Sunday's going to Parallel Products, Inc.* RC2-5

*As it is the New Bedford Business Park is a busy area with numerous businesses such as the large Service Center, Dunkin Donuts, Titleist Golf Ball, MA Registry of Motor Vehicles, Acushnet Co., American Circuit Breaker, Alberox Corp, N.E. Plastics, Milhench, AFC Cable, Epec, ete, etc.*

*Here in Briarwood we pay high house taxes, as does Pine Hill Acres and other housing developments off of Phillips Road, and other homes in the area, imagine the smell of garbage, imagine the rats we will have. Yes they will invade the businesses in the New Bedford Business Park, Briarwood, Pine Hill Acres, homes off of Phillips Road, homes in Freetown, Sassaquin, Acushnet Ave here in the far North End, lets not forget the Seagulls flying over dropping their poop on our homes and back yards where children will be playing, a child possibly being bitten by a rat.* RC2-6

*There is the old N-Star building and property at the waterfront, garbage can come in by boats, barges, Trucks off of I-195 to Rt 18, and by Rail. There is the Building 19 property that trucks can come in, there is the railroad tracks next to the property, and the property is across the street from Parallel Products, Inc property at 969 Shawmut Avenue on Hathaway Road. These are one of two excellent locations for Parallel to be located.* RC2-7

*Please stop Parallel from coming into the New Bedford Business Park.*

*Ron R. Cabral*
*67 Blaze Road*
*New Bedford, MA 02745*
*E-mail: RRCRT@aol.com*

Page Czepiga
Environmental Analyst
(617) 626-1021
page.czepiga@mass.gov

MEPA Office
100 Cambridge St., Suite 900, Boston, MA 02114

TOXICS ACTION CENTER

Re: Parallel Products

Dear Ms. Czepiga

My name is Claire B.W. Miller and I am the lead community organizer for Toxics Action Center. We are a 32-year old public health and environmental non-profit. We work in all six north-eastern states side by side with communities to clean up and prevent pollution. I am writing in concern about construction of glass processing, a MSW processing and handling facility, biosolids drying & gasification facility, and railside track in a designated Environmental Justice neighborhood. This facility plans to process 1,500 tons per day of municipal solid waste, recieve construction and demolition, and process biosolids 24 hours a day, with an expected 418 new truck trips- all next to a residential neighborhood.

We firmly believe that community involvement in decisions is key. **Please consider granting a significant and fair extension to the deadline for public comments.** TAC-1

As I'm sure you know, this location is a designated Environmental Justice neighborhood. As part of the Environmental Justice Policy of 2017, MEPA has obligations. These are screenshots from the EJ Policy:

*Enhancing the Review of New MEPA Projects in EJ Populations*

17. **Enhanced Analysis of Impacts and Mitigation Under MEPA.**[3] In addition to the enhanced public participation requirements specified in section 16 above, enhanced analysis will be required as part of the Environmental Impact Report (EIR) scope for projects that: TAC-2

- (1) Exceed a mandatory EIR threshold for air, solid and hazardous waste (other than remediation projects), or wastewater and sewage sludge treatment and disposal; *and*
- (2) Are located within one mile of an EJ Population (or in the case of projects exceeding a mandatory EIR threshold for air, within five miles of an EJ Population) [4]. The project proponent may submit actual air modeling data on the project's area of potential air impacts in its EIR scope to modify the presumed five-mile impact area referred to in condition (2) above.

Enhanced analysis of impacts and mitigation may include analysis of multiple air impacts; data on baseline public health conditions within the affected EJ population; analysis of technological, site planning, and operational alternatives to reduce impacts; and proposed on-site and off-site mitigation measures to reduce multiple impacts and increase environmental and energy benefits for the affected EJ Population.

18. **Review of Thresholds.** As required by Executive Order 552, MEPA shall seek and consider stakeholder input on which thresholds are appropriate for enhanced participation and/or enhanced analysis.

19. **Collaboration with the Director of EJ.** For any projects triggering the MEPA EJ thresholds, as defined by this Policy, the MEPA Office shall collaborate with the Director of Environmental Justice to

ensure that appropriate measures are taken by project proponents to address any potential environmental impacts the project may have on the existing EJ population. This will include, but not be limited to

TAC-3

**16. Enhanced Public Participation Under MEPA.**[1] As part of the Secretary's commitment to Environmental Justice, enhanced public participation will be required for the following projects as they undergo review in accordance with MEPA:

- (1) Any project that exceeds an Environmental Notification Form (ENF) threshold for air, solid and hazardous waste (other than remediation projects), or wastewater and sewage sludge treatment and disposal[2]; and
- (2) The project site is located within one mile of an EJ Population (or in the case of projects exceeding an ENF threshold for air, within five miles of an EJ Population).

Enhanced public participation may include use of alternative media outlets such as community or ethnic newspapers, use of alternative information repositories, and translation of materials or interpretation services prior to and during public meetings where the relevant EJ Population uses a primary language other than English in the home.

When scheduling public meetings, EEA shall recommend that project proponents consider the time of the meeting, availability of public transportation to locations, and whether locations are child-friendly and culturally appropriate. To the extent feasible, meetings should be held in places that community members already routinely use and feel comfortable visiting. Additionally, EEA shall recommend that project proponents consider whether outreach efforts need to include an educational component to ensure that community members have the information necessary to evaluate a project's potential impacts.

I would appreciate a phone call to discuss the way that these measure- particularly the public meetings have been/will be met- especially given that the EJ Director Position is currently vacant. Thank you for your consideration of these comments and for your service to all the residents of the Commonwealth.

Respectfully,

Claire B.W. Miller
Lead Community Organizer
Toxics Action Center

## Czepiga, Page (EEA)

**From:** Tracy Wallace <wallacetracy99@gmail.com>
**Sent:** Wednesday, March 27, 2019 8:41 AM
**To:** Czepiga, Page (EEA)
**Subject:** Re: Parallel Products proposed project

Hello Page,

Thank you very much for this information. I would like to add some additional comments in regards to the MEPA EENF complete report. Within the project description, it states that the site is zoned Industrial C, page 67 (page 28). That is not entirely true, the site is also zoned residential and zoned mixed business. There is no mention of the residential zoning of abutting properties, of which Parallel Products purchased two newly built homes. The full site is not zoned industrial C when consulting the site plan presented to the planning board of New Bedford in January 2017. During the presentation on March 7th the presenter indicted no production of Methane gas, however on page 13 of the complete report states the PPNE may decide to add gasification in the future to the site. The gasification process creates syn gas. Syn gas composition is known to be 7% Methane, when Methane mixes with other gases hydrogen sulfide is created, which is the rotten egg odor. Due to the location of several residential neighborhoods being within meters of the facility, this would have a dramatic impact on the community and its quality of life. This is fairly new technology and its effects on the surrounding communities are unknown. I would also like to call your attention to the Waste to Energy Project in Stamford, CT that was voted down by the Waste Pollution Control Authority in early 2010 after losing faith in its technical and economic feasibility, finding the drier itself produces significant emissions and there would be negligible economic benefit. The supervising engineer of Stamford's Water Pollution Control Authority stated that the overwhelmingly unpleasant smell that wafted in the air was due to the trucks that were parked carrying the waste. He stated in winter months, it's bad. In summer months, it'll be even more exaggerated. The complete report states that odor from the MSW and bio solids site will be minimized with ionization and wet scrubbing and by stacks ten feet above the bio solids facility and stacks from the MSW building. The study within the report mentions odor is subjective. There is no real way to know if the odor will be a nuisance or not. It also appears the stacks will be visible from the surrounding residential neighborhoods, this can decrease a property value of up to 13%. A collection of property value impacts is available from the Center for Health, Environment and Justice. The noise from heavy truck traffic lowers property value at a rate of 30 to 50 times greater than cars. This is because at 50 feet heavy trucks emit noise 16 times louder than car traffic. With regard to accidents, a fatality is twice as likely when a car is involved in a crash with a truck vs. another car. The studies included in the complete report regarding traffic, noise, odor and air quality impacts were done using conservative assumptions and computer modeling, which often does not translate to reality. The creation of waste sites tends to be around lower socio-economic communities and it seems this is of no exception. Environmental racism is environmental injustice that occurs in practice and in policy within a racialized context, exposing neighborhoods that are economically and racially disadvantaged to hazardous waste. This facility would never be put next to residents of a wealthier community. I ask you this, would you want to live within 500m or 1000m of a MSW and Bio Solids facility?

TW-1

TW-2

TW-3

TW-4

Sincerely,
Tracy L. Wallace M.Ed
Resident of New Bedford

On Mon, Mar 11, 2019 at 5:00 PM Czepiga, Page (ENV) <page.czepiga@state.ma.us> wrote:

Tracy,

## Czepiga, Page (EEA)

**From:** Tracy Wallace <wallacetracy99@gmail.com>
**Sent:** Friday, March 08, 2019 12:43 PM
**To:** Czepiga, Page (EEA)
**Subject:** Parallel Products proposed project

Hello Page,

I would like to take this opportunity to thank you and everyone who attended the meeting yesterday March 7, 2019. Everyone was very nice and welcoming. I would also like to take this opportunity to express my concern with Phase 2 of the proposed project by Parallel Products at the Industrial Park in the City of New Bedford. I would first like to bring your attention to the original site plan proposed by Parallel Products in January 2017, TW-6 and approved on March 21, 2017 with conditions. Mr. Cusson, of Parallel Products, stated in the meeting yesterday that the intention of the site was always to have been a waste site. That is not indicated in the original site plan. The site plan is for cooler storage/warehouse and additional parking, etc.... The original proposed plan also brings attention to the inadequacy of the storm drains and the undersized stormwater basins that were to be addressed when the Certificate of Compliance was applied for. There is no statement within the site plan TW-7 that indicates Parallel Products intent to move their entire operation from the Shawmut Ave location to the proposed Duchaine Blvd location. I find this to be in direct contrast to the statement made by Mr. Cusson. Regarding the MSW transfer location being moved to Duchaine Blvd, there is cause for concern due to the proximity of the residential developments in the area. The Shawmut Ave location is not in as close proximity to residential areas as the proposed Duchaine location would be. I also encourage you to visit the Shawmut Ave location. If you drive down Shawmut Ave toward the airport, there is a distinct amount of trash deposited over the roads as well as an odor. There are also concerns regarding health risks when living in close proximity to a transfer station, those include, asthma, shortness of breath, respiratory disease, cardiac disease, stroke, allergies, etc.... The proposed bio solids facility that is also part of the Phase 2 portion of the project is TW-8 cause for concern as well. When researching bio solids, there appears to be much debate over their efficacy. Bio solids could contain heavy metals, hormones, antibiotics, steroids, etc... all that would be reentered into the environment if used. When describing the project the presenter indicated that there would be no methane gas production, it would not be anaerobic, nor would it use flocculants or bugs. It does not appear to be drying beds or an incinerator either, so how is this going to be done? Would there be a way to obtain more information about the process? The presenter also indicated that a chemical scrub would be used to clean the facility and control for odor. Where would these chemicals go after scrubbing the facility? Into the municipal water system? If a cleaning agent is needed, then there is going to be an odor. The presenter also TW-9 mentioned studies conducted regarding traffic, noise, and odor, all not having a significant impact on the surrounding community. He pointed out that there would be an impact at the stop sign/intersection of Braley Rd. and Phillips Rd. I would like to mention that there is an older condominium complex at that intersection that would be impacted by the increased noise of the addition of 584 trips to the area. Is there a way to obtain copies of the studies which were conducted? A young man attended the meeting yesterday as well, he is a TW-10 resident of the area. He stated he lives across the street from the current Duchaine location, and indicated that there is already a noise issue. Truck noises that go well past 10pm. Recently, several new homes have been TW-11 built along Phillips Rd on the same side as the proposed site. Mr. Cusson indicated that Parallel Products bought the two homes closest to the site. Why did they buy the homes? They did not buy the other homes next to those two. Are they going to tell those home owners that their backyards will soon be abutting a waste site? The presenter indicated that the glass plant (part of Phase 1) would be round the clock, but was not sure the hours of operation of the MSW transfer station or bio solids facility. He thought it would be 7am to 6pm, however there seemed to be no confirmation of that. Would there be consequences in place for violations of those hours, if those are in fact the hours? The meeting was absolutely fascinating. It definitely brings to light the amount of waste we as a society produce, and the need for effective waste management. However, it would

be a shame if that need comes at the detriment of the community. I appreciate your time and consideration of my concerns.
Sincerely,

Tracy L Wallace, M.Ed
Resident of New Bedford

## Czepiga, Page (EEA)

**From:** Vincent Carolan <vincent.h.carolan3@gmail.com>
**Sent:** Friday, March 29, 2019 2:59 PM
**To:** Czepiga, Page (EEA)
**Subject:** Industrial Park New Bedford

Greetings,

My name is Vincent Carolan and I am a long time resident of New Bedford and I have major concerns regarding the MSW plant and biosolids facility being built less than a mile from my house off of Exit 7 on route 140 affiliated with Parallel Products in the large Industrial Park on Duchaine Boulevard. It has the potential to effect the quality of life via traffic, odor, noise, and pollutants and there is no upside to having this facility stationed at this location within a residential neighborhood. I strongly urge you to find alternatives. Please consider. VC-1

Sincerely,
Vincent H. Carolan III
Resident of New Bedford

**Czepiga, Page (EEA)**

| | |
|---|---|
| **From:** | Wendy Graca <wendygraca@aol.com> |
| **Sent:** | Wednesday, March 27, 2019 10:05 AM |
| **To:** | Czepiga, Page (EEA) |
| **Subject:** | Parallel Products NE Project in NB Industrial Park |

Hello Page,

I am submitting the following comments regarding the Parallel Products Project, proposed for the New Bedford Industrial Park in the North End of New Bedford. I have just recently learned of this project, and after speaking with a few local residents have found that most people are in the same uninformed "boat" as I.

Please consider granting a significant and fair extension to the deadline for public comments. Residents in the area have little to no knowledge of this project, due to poor outreach and advertisement of public meetings by the company. Also, the one public meeting I was made aware of just a few days prior (due to my making inquiring phone calls), was held at 10:00 AM on a weekday. This is a community of working class citizens. Meetings that are intended to be informative to residents regarding something that could impact their daily lives and homes should be conducted at a time when they would not need to take time off of work to attend. That is not acceptable "outreach" and does not send a message that the company is working in "good faith" and "transparency". For that reason to start, this project does not make me comfortable. WG-1

The nature and scope of this project is not to be taken lightly. Little is known about the so-called "cutting edge" technology of this facility, since there are so few of these plants in the US. It is unfair and burdensome to expect the citizens of New Bedford to take on yet another industrial project in their community without giving them all of the information, as well as the opportunity to ask questions and time to submit informed comments. WG-2

Sincerely,

Wendy M. Graca
(508) 254-6333

*City of New Bedford*
MASSACHUSETTS

**OFFICE OF THE CITY CLERK**
133 WILLIAM STREET
NEW BEDFORD, MA 02740-6182
Tel: 508-979-1450 • Fax: 508-991-6225

**DENNIS W. FARIAS**
CITY CLERK

**STEPHANIE MACOMBER**
ASSISTANT CITY CLERK

**SUSAN M. HENRIQUES**
ASSISTANT COUNCIL CLERK

May 14, 2019

RECEIVED
MAY 17 2019
Executive Office of Energy
& Environmental Affairs

Kathleen Theoharides
Secretary,
Department of Energy & Environmental Affairs
100 Cambridge St., Suite 900
Boston, MA 02114

Dear Secretary. Theoharides:

I am writing to inform you that at a meeting held on May 9, 2019, the New Bedford City Council Adopted a Written Motion, sponsored by Councillor Gomes and co-sponsored by the entire Council, *"On behalf of the residents and businesses in the immediate area of the New Bedford Business Park, requesting that the City Council go on record as being in opposition to the waste, recycling, trash and sludge facility currently being proposed by Parallel Products of New England, located at 100 Duchaine Blvd; and further, that letters be sent to the Mass. Department of Energy & Environmental Affairs and the City of New Bedford's Planning Department, Board of Health, Environmental Stewardship and Conservation Commission, asking that unfavorable recommendations be made concerning this proposal and/or that any permits sought by Parallel Products for this project be denied due to the fact that the location of said business is in very close proximity to a residential area and that the New Bedford Business Park was established and intended for production and hi-tech businesses; furthermore, that letters be sent to Gov. Baker, Sen. Mark Montigny and the City's entire State legislative delegation, Senators Warren and Markey and Congressman Keating, expressing the City Council's opposition to any state or federal permitting of this facility; and that letters also be sent to every business located in the Business Park, asking that they join the community and City officials in our firm opposition to this type of industry being located within this area; and finally, that the Committee on Appointments & Briefings meet with all park businesses in order to learn their opinions regarding this proposed project and what impact they foresee it having on the Business Park, the residents and overall quality of life within the area."* CCC-1

As such, the Council respectfully requests your support and assistance in its effort to bring about a positive resolution to this important matter. On behalf of the entire City Council, I thank you for your time and attention. Please feel free to contact me directly should you or your office require additional information.

With kind regards,

Dennis L. Farias

Dennis W. Farias
City Clerk/Clerk of the City Council

cc: All Councillors
File

City of New Bedford

**Office of City Council**
133 William Street • New Bedford, Massachusetts 02740
(508) 979-1455 • Fax: 508-979-1451

**Brad Markey**
*Councillor Ward One*

RECEIVED
MAY 10 2019
MEPA

May 2, 2019

RE: EEA 15990 Parallel Products

Dear Ms. Czepiga

I am writing you regarding my concerns and the concerns of the residents in the surrounding areas on the Parallel Products project which is a proposed expansion at 100 Duchaine Blvd. in the New Bedford Industrial Park. The Industrial Park as well as the proposed expansion abuts heavily populated neighborhoods and we are concerned that this expansion can have a detrimental effect on these neighborhoods.

There are many concerns with the processing at this facility, health concerns of toxins being emitted into the air, odor, as well as issues with the proximity to wet lands. CC-1

Other issues effecting the quality of life in the area from this project would be noise, air pollution from the processing and, with the increase of truck traffic going into this facility every day, air quality from the diesel emissions. CC-2

While air quality is a major concern there is also traffic issues. With the many trucks making their way into the facility this is adding more traffic congestion into an already high traffic area. CC-3

I ask you to carefully review this project and to consider the neighborhood's concerns which are stated above and to their quality of living.

Sincerely,

Brad Markey

Brad Markey

City Councilor Ward 1

*Residence:* 1520 Morton Avenue • New Bedford, Massachusetts 02745 • Tel.: (508) 998-8377
Brad.Markey@newbedford-ma.gov

## Czepiga, Page (EEA)

**From:** Buckley, Deirdre (EEA)
**Sent:** Wednesday, May 15, 2019 1:05 PM
**To:** Czepiga, Page (EEA)
**Subject:** FW: Parallel products of New Bedford

-----Original Message-----
From: Schwalbert, Nick (EEA) <nick.schwalbert@mass.gov> On Behalf Of internet, env (EEA)
Sent: Wednesday, May 15, 2019 1:01 PM
To: Buckley, Deirdre (EEA) <deirdre.buckley@mass.gov>
Subject: FW: Parallel products of New Bedford

Sending your way per Sarah's request.

Nicholas Schwalbert
617-626-1022

-----Original Message-----
From: Donna [mailto:dmpeko@comcast.net]
Sent: Wednesday, May 15, 2019 11:07 AM
To: internet, env (EEA)
Subject: Parallel products of New Bedford

I am writing as I believe the site description in EEA #15990 is deceiving. It does not reflect the hundreds of single family home east of DP-1
Phillips road. It describes a site surrounded by industrial sites.
It also states that glass processing is limited to enclosed building. Glass processing is occurring under a canopy and residents whose DP-2
home are only a few hundred feet away are already noting odors and noise issues.
I am writing to request your agency review this decision as well as deny phase 2 which would have a great affect on the adjacent neighborhoods.
Donna Poyant
39 Ridgewood Rd New Bedford MA 02745

Sent from my iPhone

**CITY OF NEW BEDFORD**
**JONATHAN F. MITCHELL, MAYOR**

May 10, 2012

Executive Office of Energy and Environmental Affairs (EEA)
Attention: MEPA Office
Paige Czepiga: EEA No. 15990
100 Cambridge St, Suite 900
Boston MA 02114

RE: EEA 15990: Parallel Products

Dear Ms. Czepiga,

I write in strong opposition to the establishment of a glass/solid waste/biosolids processing facility to be operated by Parallel Products at 100 Duchaine Boulevard in New Bedford. In addition, I strongly urge MEPA to deny a Phase I Waiver to allow Parallel Products to proceed with the first phase of development as described in the April 12, 2019 Draft Record of Decision.

The company has operated a glass bottle recycling operation at the location for some time in compliance with local zoning, site plan conditions, and conservation restrictions. However, the site as newly conceived, would be an entirely different creature--especially with the inclusion of a biosolids processing facility as detailed in the company's MEPA filing in February. NB1-1

On March 29 I submitted comments to MEPA regarding the proposed project. The concerns and objections I raised on behalf of the City all remain valid. (I refer you to items 1-7 contained in the letter.) Most important, I made clear then, as well as in several subsequent public remarks, that the burden was on the company to demonstrate that its project would not pose a threat to the quality of life in surrounding neighborhoods.

Since that time, concerns regarding the potential odor, noise, and traffic impacts of the Parallel Products proposal have grown significantly among both neighborhood residents and municipal departments. Based on what we have learned in recent weeks regarding potential odor, noise, and traffic impacts, there is ample evidence to conclude that this project is wrong for New Bedford. NB1-2

With respect to the company's Waiver request, I believe it important for MEPA to consider the request in the full context of the development proposed at the site. The first development phase is now a part of a much larger, more impactful, multi-faceted project. It is therefore imperative that permitting authorities revise their approach accordingly. For example, at least one component in the first phase (rail access) now also has a direct connection to uses (including biosolid processing) that are being contemplated in future phases. In this broader context, it does not make sense to treat <u>any</u> Phase I component in isolation. NB1-3

It is therefore wrong and irresponsible to provide a Waiver for certain aspects of the proposed expansion and allow the facility to be effectively approved piecemeal by the state, without adequate analysis and an understanding of the cumulative impact of the project as a whole. On behalf of local residents and businesses, I urge MEPA to refrain from approving any Waivers and instead mandate a full Environmental Impact Report be completed before any state decisions are made on any aspect of development at the site.

Thank you for this opportunity to express my opposition to the Waiver and the project more generally.

Sincerely,

Jon Mitchell

CC: Energy & Environmental Affairs Secretary Kathleen Theoharides
MassDEP Commissioner Martin Suuberg
Senator Mark Montigny
Representative Paul Schmid
Representative Christopher Hendricks
New Bedford City Council
New Bedford Planning Board

May 1, 2019

Massachusetts Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

RECEIVED
MAY 07 2019
Executive Office of Energy
& Environmental Affairs

RE: Parallel Products of New England, LLC
New Bedford MA
EEA Number: 15990

Dear Sir or Madam:

In regard to the proposed project listed above, We have attended the public meeting on Monday, April 29, 2019 and heard the information provided by Parallel Projects regarding this project, and wish to reiterate our STRONG Opposition to this project.

The many concerns brought up by the public during this meeting include:

1) Traffic access to the projected site cannot be controlled and guaranteed that they will access the Property from the Braley Road entrance as suggested. If these trucks access the property from the Phillips Road entrance they will be traveling in a rural neighborhood which is not equipped to handle this large volume of commercial traffic in a school zone with family/children neighborhood. MR-1
2) Odor and noise from the proposed 24 hour operation at the location will be heard and experience by a large amount of residences due to the proximity of the proposed site to the abutting neighborhood properties. Even though this project property is in an industrial park the abutting residential properties on Phillips Road and surrounding neighborhoods are close enough to be impacted by this companies operation. MR-2
3) Residents were concerned about the chemicals used in the processing operation and the impact on the air we will be breathing living next to this project. MR-3

This is just a few of the several complaints and concerns brought to the attention of the Vice President of Parallel Products. It appeared that the experts that were there were unable to answer specific question regarding their STUDIES that were conducted regarding traffic and odor/noise.

4) Those in attendance at the informational meeting on April 29, 2019 were not informed that there was a open public comment period following that meeting. MR-4

5) I found about it on their website. If more people were aware of this public meeting and the proposed project, and took the time to learn about it, I am sure you would receive additional opposition. MR-5

We hope that you will reconsider the approval of this project and acknowledge the strong opposition of the residents who live in this proposed project site's back yard.

If more time was available I am sure that more people would object . We will be following this project and plan on objecting each time we are provided an opportunity.

Thank You For Your Consideration !!!!

Michelle Roza

Re: PARALLEL PRODUCTS OF NEW ENGLAND

We, the following people hope that you will reconsider the allowance of this project and wish to have our opposition on record in regards to project:

Kimberly J Bancroft KIMBERLY J. BANCROFT 822 PINE HILL DR New Bedford 02745
Michelle Roza MICHELLE ROZA 28 ANGELICA AVENUE NEW BEDFORD 02745
Magen Crepeau Magen Crepeau 34 Angelica Ave New Bedford MA 02745
Chad Crepeau Chad Crepeau 34 Angelica Ave New Bedford MA 02745
[illegible] 19 Angelica Ave New Bedford MA 02745
[illegible] 19 ANGELICA AVE NEW BEDFORD 02745
Paul Mathia PAUL MATHIA 1401 Braley Rd NEW BEDFORD MA 02745
Patricia Mathia 1401 Braley Rd New Bedford MA 02745
Patricia [illegible] 1443 Old Plainville Rd New Bedford MA 02745
[illegible] CARL ROZA 28 ANGELICA AVE NEW BEDFORD MA 02745
[illegible] 41 ANGELICA AVE N.B. 02745
Kelly Vieira 41 ANGELICA AVE N.B. 02745
STEVEN B Ellis PO BOX 50023 NB 02745
Heather Ross 2114 Phillips Rd #18 New Bedford, MA. 02745
Tyler Ellis 2114 Phillips Rd. #18 NB, MA. 02745
Traci L Lourenco 13 Medeiros Lane No. Dartmouth Ma 02747
PAULA DRAPER Paula Draper 13 Crystal Spring Rd Mattapoisett 02739
[illegible] C [illegible] 38 ANGELICA AVENUE 02745
[illegible] 38 ANGELICA AVENUE 02745
[illegible] 25 ANGELICA AVE 02745 SCOTT LAFRANCE
Kathleen Oliveira 25 Angelica Ave 02745
[illegible] 1399 Braley Rd N.B. 02745
[illegible] 54 Angelica Ave 02745
CHARLENE DENELLO 54 ANGELICA AVE 02745
FRANK RODRIGUES JR 74 ANGELICA AVE 02745
MARY BARBOSA 1399 BRALEY RD 02745
Amy Rivas 36 Adams St N.B 02746
Crystal Onofrey 30 Grape St. N.B 02740
Gabriela Vitorin 297 Earle St NB 02746
Vanessa Pimentel 82 Cedar St. N.B. MA 02740

RE: PARALLEL PRODUCTS

We, the following people hope that you will reconsider the allowance of this project and wish to have our opposition on record in regards to project:

Thomas T. Rua THOMAS T. RUA 1481 Phillips RD
" " " " APT 1206 NEW BEDFORD
Rita B. Lizotte RITA B. LIZOTTE 1481 Phillips Rd. N.B. Apt. 1205
Sharon Rua Sharon Rua 1481 Phillips Rd N.B Ma #1206
Jeanne Kelley Jeanne Kelley 1481 Phillips Rd #1401
R P Kelley RAYMOND P. KELLEY 1481 PHILLIPS ROAD
Elizabeth Labelle Elizabeth Labelle 1481 Phillips R[illegible]
Suzanne Fawcett SUZANNE FAWCETT 1481 Phillips Rd #1106
John S. Bastoni JOHN S. BASTONI 1481 PHILLIPS RD # 1105
Isabel Borges 1481 Phillips Road unit #1108
Jennie E Morris 1481 Phillips Rd. Unit #1101
Alfred Morris 1481 Phillips Rd. unit #1101
Veronica McCarthy 1481 Phillips Rd. #1103
Lorraine Medeiros 1481 Phillips Rd #1301
Wilda Rodrigues 1481 Phillips Rd 1307
[illegible] Costa 1481 PHILLIPS RD. #1401
Fatima da Costa 1481 Phillips Rd. #1401 New Bedford
Jeannette Bedard 1481 Phillips Rd. #1204 New Bedford
[illegible] Bedard 1481 Phillips Rd. #1204 N.B. Ma 02745
LORRAINE PRINCE 1229 ROSE ANNE St New Bedford MA 02740
[illegible] 1229 Roseanne St New Bedford MA 02740
Filomena Quede 158 Heritage Dr New Bedford, MA 02745
Lena SILVA 52 SWIFT ST, New Bedford MA 02740

construction of a building and installation of solar PV within previously altered and impervious areas and extension of a RR line using funds from MassDOT's IRAP grant program.

I have received numerous comment letters that identify concerns regarding the project and public outreach. During the MEPA review period, the Proponent agreed to hold a public meeting which will provide the community with an additional opportunity to learn about and comment on the project. The Proponent intends to schedule this meeting prior to the close of the comment period on the DROD (May 8). If the meeting is delayed, the comment period on the DROD will be extended such that it will not close before the public meeting is held. This will provide an opportunity for the community to comment on the DROD based on information learned at the meeting.

In light of the regional benefits and limited impacts associated with Phase 1, strict compliance with the requirement to prepare a Mandatory EIR for the project prior to Phase 1 would result in undue hardship and would delay the regional benefits to the glass recycling market identified in MassDEP's comment letter. The Proponent will redevelop a previously altered site within an industrial park, which has adequate vehicular access and is easily accessible from Route 140 (Alfred M Bessette Memorial Highway). In addition, the Proponent has committed to implement adequate measures to avoid, minimize, and mitigate Phase 1 impacts. Comments from MassDEP and MassDOT indicate support for the Waiver. I find that strict compliance with the requirement to submit an EIR prior to completion of Phase 1 of the project would result in an undue hardship and would not serve to avoid or minimize Damage to the Environment.

In accordance with 301 CMR 11.11(4), the latter finding is based on my determination that:

**1. The potential environmental impacts of Phase 1, taken alone, are insignificant.**

Potential impacts associated with Phase 1 do not exceed ENF thresholds. The majority of development is located within previously altered and impervious areas. Potential environmental impacts of Phase 1 are primarily associated with construction of the RR side track which will alter wetland resource areas. The New Bedford Conservation Commission will review Phase 1 to determine its consistency with the Wetlands Protection Act (WPA), the Wetlands Regulations (310 CMR 10.00), and associated performance standards, including the Stormwater Management Standards (SMS). The Proponent will provide wetland replication and design the crossing to comply with MassDEP's Stream Crossing Standards.

**2. Ample and unconstrained infrastructure facilities and services exist to support Phase 1.**

The site provides infrastructure necessary to support Phase 1, including access roads, water and sewer, and electricity. Phase 1 will construct a RR extension to facilitate shipment of outbound material via rail car. Existing roadway infrastructure can accommodate traffic generation associated with the project. Based on the foregoing, I find that ample and unconstrained infrastructure exists to support Phase 1.

**3. The project is severable, such that Phase 1 does not require the implementation of any other future phase of the project or restrict the means by which potential environmental impacts from any other phase of the project may be avoided, minimized or mitigated.**

The Phase 1 project can function independently without the remaining development. Phase 1 does not require the implementation of remaining development phases or restrict the means by which potential environmental impacts from remaining development may be avoided, minimized, or mitigated.

**4. The Agency Action(s) on Phase 1 will contain terms such as a condition or restriction, so as to ensure due compliance with MEPA and 301 CMR 11.00 prior to commencement of any other phase of the project.**

The Proponent is seeking Financial Assistance from MassDOT for Phase 1. I hereby direct MassDOT to include a condition in their funding agreement that requires compliance with MEPA and 301 CMR 11.00 prior to commencement of Phase 2. Based on the foregoing, I find that Phase 1 of the project can commence prior to the completion of the MEPA review process.

Given the foregoing, and subject to the conditions included herein, I find that a requirement to complete MEPA review prior to Phase 1 is not necessary to demonstrate that it will avoid, minimize, and mitigate potential Damage to the Environment to the maximum extent practicable, and that a requirement to do so would therefore cause undue hardship and would not serve to minimize Damage to the Environment.

Conclusion

Based on these findings, I have determined that this waiver request has merit, and am issuing this DROD, which will be published in the next edition of the Environmental Monitor on April 24, 2019 in accordance with 301 CMR 11.15(2), which begins the public comment period. The public comment period will last for 14 days and will end on May 8, 2019 unless an extension is necessary to accommodate the ~~public meeting~~. Based on written comments received concerning the DROD, I shall issue a Final Record of Decision (FROD) or a Scope within seven days after the close of the public comment period, in accordance with 301 CMR 11.15(16).

April 12, 2019
Date

Matthew A. Beaton

Comments received:

Form letters beginning "I am strongly opposed to the…" (1,013 received)
Form letters beginning "I strongly support the…" (two received)

| | |
|---|---|
| 03/08/2019 | Tracy Wallace (1 of 2) |
| 03/18/2019 | Robert Ladino |
| 03/22/2019 | Massachusetts Department of Environmental Protection (MassDEP) (1 of 2) |
| 03/26/2019 | Roger Cabral |
| 03/26/2019 | Cheryl Souza |
| 03/27/2019 | Marlene Pollock |

Secretary of Energy & Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114
Attn: MEPA Office

RECEIVED
MAY 02 2019
MEPA

RE: Parallel Products of New England, LLC

I am **strongly opposed** to the Parallel Products of New England, LLC Waste Transfer Station project at 100 Duchaine Boulevard, New Bedford, MA. We do not need this horrendous project in our neighborhood.

There is no good reason to impose a facility like this on a community that has plenty of capacity for the disposal of waste. We do not want to be the dumping ground of Southeastern Massachusetts. As a group we will use whatever means necessary to make sure our neighborhood is not dumped on!! RC4-1

Sincerely,

Signature Robert E Charon

Name ROBERT E CHARON

Address 3913 ACUSHNET AVE
NEW BEDFORD MA

## Czepiga, Page (EEA)

**From:** Ron <rrcrt@aol.com>
**Sent:** Sunday, May 05, 2019 11:55 PM
**To:** antonio.cabral@mahouse.gov; chris.hendricks@mahouse.gov; christopher.markey@mahouse.gov; paul.schmid@mahouse.gov; william.straus@mahouse.gov; michael.moynihan@masenate.gov; mark.montigny@masenate.gov; Ian.Abreu@newbedford-ma.gov; Naomi.Carney@newbedford-ma.gov; Debora.Coelho@newbedford-ma.gov; Hugh.Dunn@newbedford-ma.gov; Brian.Gomes@newbedford-ma.gov; Dana.Rebeiro@newbedford-ma.gov; Linda.Morad@newbedford-ma.gov; Joseph.Lopes@newbedford-ma.gov; Brad.Markey@newbedford-ma.gov; Maria.Giesta@newbedford-ma.gov; Scott.Lima@newbedford-ma.gov; Jon.Mitchell@newbedford-ma.gov; kristine.arsenault@newbedfordma.gov
**Cc:** Buckley, Deirdre (EEA); Schluter, Eve (EEA); Wixon, Josephine (EEA); Canaday, Anne (EEA); Patel, Purvi (EEA); Czepiga, Page (EEA); Strysky, Alexander (EEA); Flaherty, Erin (EEA); MEPA (ENV); TimC@parallelproducts.com; newbedford@parallelproducts.com
**Subject:** Fwd: Attached letter ref Parallel Products, Inc.
**Attachments:** Draft-Record-of-Decision-April-12-2019.pdf

**Follow Up Flag:** Follow up
**Flag Status:** Completed

***Good morning***

***Please read the attached letter regarding Parallel Products and the Commonwealth of Massachusetts Environment and Energy. I was quite surprised when I read the letter in particular Page 3 Paragraph 2 which is copied below.***

***The Proponent consulted with MassDEP and the MEPA Office regarding the enhanced outreach requirements of the EJ Policy. The Proponent published Spanish and Portuguese language versions of the MEPA Public Notice in El Planeta and the Portuguese Times (respectively) in addition to the New Bedford Standard Times. The Proponent also notified the following organizations of the project and MEPA scoping session and provided them with a copy of the EENF: Coalition for Social Justice, Alternatives for Community & Environment, Hands Across the River Coalition, and Old Bedford Village. These were identified as EJ leaders based on consultation with MassDEP. The comment period was extended for two-weeks at the Proponent's request to provide additional time to review and comment on the EENF. The comment period commenced on February 20, 2019 and concluded on April 5, 2019. I accepted all late comments as allowed in accordance with 301 CMR 11.06(3). A MEPA site visit and scoping session was held on March 7, 2019. Spanish and Portuguese translation services were provided at the MEPA scoping session.***

***Just wondering if any of the City and State Officials knew about this meeting? If so, why wasn't the residents in the area invited or made aware of this meeting?*** RC3-1

***Why were the Coalition for Social Justice, Alternatives of Community & Environment, Hands Across the River Coalition, and Old Bedford Village invited?***

***Also read that the company wants the state to give $500,000 for a side rail line to the property. This company is privately owned, why should we the taxpayers pay for a side rail line for the Parallel Products, Inc.? We are unable to get a commuter rail line from New Bedford to Boston although the state is working on it, lol.*** RC3-2

*We the residents/taxpayers, which I have been in contact with many, in the area deserve another meeting to be held at the Pulaski School, Parallel Products, Inc. should post at their expense in all news media a notice of such meeting, and being in large print. Hopefully Mayor Mitchel would be able to attend this meeting, sadly he was unable to attend the April 29th meeting.* RC3-3

***Again, I would like to know if anyone of the City Officials, or State Officials knew about this meeting, I would like to hear from City and State Officials, that is if anyone is willing to respond.***

***My E-mail address is: RRCRT@aol.com***

***Respectfully,***

***Ron R. Cabral***
***67 Blaze Road***
***New Bedford, MA 02745***

COMMONWEALTH OF MASSACHUSETTS

**THE GENERAL COURT**

STATE HOUSE, BOSTON 02133-1053

RECEIVED

MAY 20 2019

Executive Office of Energy & Environmental Affairs

May 14, 2019

Honorable Kathleen Theoharides
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

RE: EEA 15990 Parallel Products of New England

Dear Secretary Theoharides:

I am writing today to express deep concerns regarding Parallel Products of New England's most recent proposal to construct an expanded waste facility in very close proximity to a residential neighborhood.

The New Bedford Business Park was never intended to serve waste processing operations. Rather, it is a prime location for world-class manufacturing operations such as Titleist and Ahead, LLC. Parallel Products of New England (PPNE) proposes to dramatically alter the nature of this facility, which could hinder future investments by third parties. MM-1

Furthermore, I have received significant concerns from nearby residents regarding the project's potential impacts on noise, odors, traffic, and overall aesthetics of the neighborhood. It is also my understanding that the project is located within one mile of an Environmental Justice population, triggering enhanced public participation requirements under MEPA. To date, there has been very little opportunity for public participation. MM-2

At this time, PPNE has failed to satisfy deep concerns expressed by nearby residents and local officials. Unless and until PPNE can seriously address these significant problems, this project should not proceed. EEA should not approve a final EIR and MassDEP should deny any application for a site suitability permit. MM-3

In closing, I would appreciate an opportunity to discuss this matter in further detail. In the meantime, I will continue to listen to concerned constituents and will respond appropriately. Thank you for your consideration of these concerns, and I look forward to hearing from you.

Sincerely,

Mark C. Montigny

Mark Montigny
**SENATOR**

ATTACHMENT 18

DRAFT CHAPTER 61 FINDINGS

# PARALLEL PRODUCTS OF NEW ENGLAND, INC.

## Section 61 Findings

EEA # 15990

100 Duchaine Boulevard
New Bedford, Massachusetts 02745

**November 2019**

**Prepared For:**

Parallel Products of New England, Inc.
100 Duchaine Boulevard
New Bedford, Massachusetts 02745

**Green Seal Environmental, Inc.**

**114 State Road, Building B, Sagamore Beach, MA 02562 | Tel: (508) 888-6034 | Fax: (508) 888-1506 | www.gseenv.com**

# PPNE - Section 61 Findings

**Introduction**

Parallel Products of New England, LLC (hereinafter "PPNE") has prepared these draft Section 61 Findings to comply with the requirements of the Secretary's Certificate issued on April 12, 2019 for EEA #15990.

**Scope**

The document was designed to present the information required in Massachusetts General Law (MGL) Chapter 30, Section 61, the Massachusetts Environmental Policy Act (MEPA) regulations (301 CMR 11.00, section 11.12), and scope of the Draft Environmental Impact Report required by the Secretary of Energy and Environmental Affairs.

**TOC**

The following table describes and directs the reader to specific sections within this document.



Continued on next page

# PPNE - Section 61 Findings, *Continued*

**Regulatory Overview**

In accordance with M.G.L. c. 30, section 61, any Agency, that takes Agency Action on a Project for which the Secretary required an EIR, shall determine whether the Project is likely to, directly or indirectly, cause any Damage to the Environment and make a finding describing the Damage to the Environment and confirming that all feasible measures have been taken to avoid and minimize the Damage to the Environment.

**Contents of Section 61 Findings:** In all cases, the Agency shall base its Section 61 Findings on the EIR and shall specify in detail: all feasible measures to be taken by the Proponent, or any other Agency or Person, to avoid Damage to the Environment or, to the extent Damage to the Environment cannot be avoided, to minimize and mitigate Damage to the Environment to the maximum extent practicable. The Draft EIR (DEIR) is required as part of the Certificate of the Secretary of Energy and Environmental Affairs to include a separate chapter on mitigation measures associated with DEIR and that this chapter also includes Draft Section 61 Findings for all state agency actions. The Draft Section 61 Findings shall contain a clear commitment to implement mitigation, an estimate of the individual costs of the proposed mitigation, identification of the parties responsible for implementing the mitigation, and a schedule for the implementation of mitigation. In accordance with M.G.L. c. 30, section 61, the reasonably foreseeable climate change impacts of a project, including its additional GHG emissions, and effects, such as predicted sea level rise shall be taken into consideration.

**Section 61 Findings and Agency Action:** Provided that mitigation measures are specified as conditions to or restrictions on the Agency Action, the Agency shall:

1. Make its Section 61 Findings part of the Permit, contract or other document allowing or approving the Agency Action, which may include additional conditions to or restrictions on the Project in accordance with other applicable statutes and regulations; or

2. Refer in its Section 61 Findings to applicable sections of the relevant Permit, contract or other document approving or allowing the Agency Action.

Continued on next page

# PPNE - Section 61 Findings, *Continued*

| | |
|---|---|
| **Regulatory Overview *(continued)*** | **<u>Subject Matter Jurisdiction Limitations on Section 61 Findings</u>**: In the case of a Project undertaken by a Person that requires one or more Permits or a Land Transfer but does not involve Financial Assistance, any Participating Agency shall limit its Section 61 Findings, or any mitigation measures specified as conditions to or restrictions on the Agency Action, to those aspects of the Project that are within the subject matter of any required Permit or within the area subject to a Land Transfer.<br><br>**<u>Proposed Section 61 Findings:</u>** Proposed Section 61 Findings prepared by a Proponent in accordance with 301 CMR 11.07(6)(k) are intended to assist a Participating Agency in fulfilling its obligations in accordance with M.G.L. c. 30, section 61. The Proponent's preparation of Proposed Section 61 Findings shall not mean that a Participating Agency has made its own Section 61 Findings. Except in accordance with 301 CMR 11.06(4) and 11.08(7), the Proponent's Proposed Section 61 Findings shall not limit an Agency's discretion in making its own Section 61 Findings.<br><br>**<u>Filing and Distribution of Section 61 Findings:</u>** The Proponent and a Participating Agency shall each file a copy of the Section 61 Findings with the Secretary, who shall publish notice of the availability of the Section 61 Findings in the next Environmental Monitor in accordance with 301 CMR 11.15(2), and shall each circulate copies of the Section 61 Findings to any Agency or Person upon request. |
| **MEPA EENF Certificate and DEIR Scope & Comments** | PPNE received a "Certificate of the Secretary of Energy and Environmental Affairs on the EENF (EEA # 15990) on April 12, 2019. According to the certificate… ***"Based on a review of the EENF, consultation with state agencies and a review of comment letters, I hereby require the proponent to file a Draft EIR and Final EIR. The scope below identifies additional information and analysis that should be provided in the DEIR to demonstrate that environmental impacts have been minimized, avoided and mitigated to the maximum extent feasible; to demonstrate that he project will not disproportionately an EJ community; and to provide information and analysis for permitting agencies to evaluate consistency with regulatory standards and to make associated Section 61 findings."*** |

Continued on next page

## PPNE - Section 61 Findings, *Continued*

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**MEPA EENF Certificate Draft Section 61 Findings Scope**

The following scope was issues as part of the EENF certificate. ***"The DEIR should include a separate chapter summarizing proposed mitigation measures. This chapter should also include draft Section 61 Findings for each State Agency that will issue Permits for the project. The DEIR should contain clear commitments to implement mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation (either funding design and construction or performing actual construction), and contain a schedule for implementation. To ensure that all GHG emissions reduction measures adopted by the Proponent in the Preferred Alternative are actually constructed or performed by the Proponent, I require Proponents to provide a self-certification to the MEPA Office indicating that all of the required mitigation measures, or their equivalent, have been completed. The commitment to provide this self-certification in the manner outlined above should be incorporated into the draft Section 61 Findings."***

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**Background**

The PPNE facility will be developed as a state-of-the-art solid waste handling and processing facility. The proponent will design and develop a modern, mechanized recycling facility that will support the regional needs within this geographical area of Massachusetts. The project will handle municipal solid waste (MSW), construction and demolition waste (C&D) and biosolids.

---

**MassDEP EENF Comments**

MassDEP reviewed the EENF and issued a comment letter to MEPA on March 22, 2019. The comment letter summarized areas that should be addressed during the permitting and development processes.

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Continued on next page

# PPNE - Section 61 Findings, *Continued*

**Draft MassDEP Section 61 Findings**

**Department of Environmental Protection Proposed Section 61 Findings**

**Project Name:** Parallel Products of New England – MSW and Biosolids Facility

**Project Location:** New Bedford, Massachusetts

**Project Proponent:** Parallel Products of New England, LLC

**EEA #:** 15990

**Date Noticed in Environmental Monitor:** ___________

The Proposed Section 61 Findings below and the subsequent sections contain commitments that the Proponent has made and will serve as a basis for the MassDEP's Section 61 Findings. The mitigation measures include commitment to reduce impacts associated with:

- Storm water
- Wetlands and riverfront areas
- Transportation
- Nuisance conditions (air, sound, etc.)
- Greenhouse gas emissions
- Endangered, Historic and Archaeological resources
- Consistency with Regulations and Policy

These Findings are for the Parallel Products of New England, LLC – Facility (EEA #15990) and have been prepared in accordance with the provisions of M.G.L. c. 30, Section 61 and 301 CMR 11.00. On [insert date] the Secretary of Energy and Environmental Affairs issued a Certificate stating that the Project's Final Environmental Impact Report (Final EIR), dated [insert date] adequately and properly complied with the MEPA statute and regulations.

Continued on next page

## PPNE - Section 61 Findings, *Continued*

**MassDEP Section 61 Findings (*continued)***

The facility will accept MSW, C&D and biosolids for processing. MSW will be processed in state of the art separation equipment to extract recyclable material. After processing, the non recyclable fraction of the MSW will be loaded in to rail cars for shipment to out of state disposal facilities. The facility will also accept C&D residual waste and bulky waste. This waste is classified as Category 2 and Category 3 C&D waste by MassDEP. Category 2 waste is C&D waste that has been processed by a C&D processing facility and Category 3 is bulky waste that has little or no recyclable value. The processing facility will have removed all waste ban material and other recyclable material from the C&D material as deemed appropriate. The Category 2 or Category 3 material accepted at the facility will be used as cover for baled MSW in the rail cars. PPNE will be required to comply with existing Waste Ban requirements set forth in 310 CMR 19.017 as part of their operational requirements. Biosolids accepted for processing will be dried to reduce the volume of the biosolids. The dried biosolids will then be sent for disposal in rail cars. The facility will maintain and report all of their inbound and outbound statistics to the MassDEP on a quarterly and annual basis.

Continued on next page

# PPNE - Section 61 Findings, *Continued*

**MassDEP Section 61 Findings *(continued)***

Based upon its review of the MEPA documents, the permit applications submitted to date, and the Department's regulations, the Department finds that the terms and conditions to be incorporated into the permit required for this Project will constitute all feasible measures to avoid damage to the environment, including consideration of the potential effects of climate change, and will minimize and mitigate such damage to the maximum extent practicable for those impacts subject to the Department's authority (see the Mitigation Table which is incorporated into the Section 61 Findings). Implementation of the mitigation measures will occur in accordance with the terms and conditions set forth in the permits.

________________________________________
Department of Environmental Protection

________________________________________
By

________________________________________
Date

**Permitting and Agency Actions**

The following provides an overview of permitting and/or agency actions that will occur as a result of the proposed facility.

**<u>US Environmental Protection Agency</u>**

- Notice of Intent for Storm Water Discharges - prior to the start of construction, the owner must file a Notice of Intent to obtain coverage under an NPDES Storm Water Construction General Permit. ***This permit will be filed with the USEPA prior to the start of construction***

**<u>Executive Office of Energy and Environmental Affairs</u>**

- 301 CMR 11.00 – MEPA Regulations – Expanded Environmental Notification Form (EENF), Draft Environmental Impact Report (DEIR), and Final Environmental Impact Report (FEIR) outlined under 301 CMR 11.03(9) – Solid and Hazardous Waste, and 11.03(5) Wastewater. ***EENF is complete and Draft EIR is presently being prepared. The Final EIR will be prepared following the acceptance of Draft EIR.***

Continued on next page

## PPNE - Section 61 Findings, *Continued*

**Permitting and Agency Actions *(continued)***

**Massachusetts Department of Environmental Protection**

- 310 CMR 16.00 - Site Assignment for Solid Waste Facilities (BWP SW-01). ***Application is in a "draft' form and will be finalized and submitted to MassDEP upon acceptance of the Final EIR.***

- 310 CMR 19.000 – Solid Waste Regulations – Authorization to Construct (BWP SW-05). ***Anticipated to be submitted to MassDEP upon completion of the Site Assignment Hearings.***

- 310 CMR 19.000 – Solid Waste Regulations – Authorization to Operate (BWP SW-06) ***Anticipated to be submitted to MassDEP upon completion of project construction.***

- 310 CMR 10.00 – Wetlands Protection Act Regulations – Order of Conditions and National Pollutant Discharge Elimination System for Construction Activities through USEPA. ***Notice of Intent in accordance with the wetlands protection act prior to submission of an ATC application. Notice of Intent for NPDES General Permit to be submitted to EPA prior to the start of construction.***

- 310 CMR 27.00 - Underground Injection Control. A permit application will be submitted prior to construction to infiltrate the storm water from the associated roof runoff. ***Will be submitted to MassDEP prior to submission of an ATO application.***

**City of New Bedford, Massachusetts**

- Board of Health – Site Assignment under 310 CMR 16.00. ***Hearings will be held upon receipt of a positive site suitability determination.***

- Planning Board – Zoning By-Law - Site Plan Review. ***Site plan review and approval will be received prior to submission of an ATC application with MassDEP.***

- Conservation Commission – Order of Conditions. ***Notice of Intent will be filed and Order of Conditions will be issued prior to submission of an ATC application with MassDEP.***

Continued on next page

# PPNE - Section 61 Findings, *Continued*

**Mitigation Summary**

The table presented below outlines areas where impacts have been assessed and/or identified; the potential impacts; associated mitigation commitments; and a schedule of when mitigation measures will be implemented. GSE has added reference to where additional data may be found with respect to the mitigations measures when deemed applicable.

| AREA OF CONCERN | IMPACT | MITIGATION MEASURE DESCRIPTION | SCHEDULE, COST & RESPONSIBILITY |
|---|---|---|---|
| **Greenhouse Gas Emissions** | Facility could yield impacts through the use of energy, fossil fuels and construction if it is not properly planed and/or operated. | • Conditioned spaces will meet mandatory and prescriptive requirements of the energy code<br>• A 20% reduction over Code in lighting installations electricity use in the new buildings (glass handling, MSW tipping, and biosolids processing) and in the MSW processing area of the existing building<br>• High-efficiency mechanical equipment;<br>• VFDs where appropriate;<br>• High-performance building envelopes;<br>• PV-ready new construction;<br>• Construction waste recycling.<br>• Utilization of rail transport will reduce GHG by 60% when compared with the use of trucks<br>***Please refer to the Greenhouse Gas Emission Analysis section of the DEIR and the full GHG report included as Attachment 16.*** | **Schedule:**<br><br>Mitigation measures will be incorporated into final project design and specifications. Design including mitigation measures will be included in ATC application and once installed and/or instituted will occur throughout the life of the project.<br><br>**Cost :** $125,000<br><br>**Responsibility**<br>Project Architect/PPNE |

Continued on next page

# PPNE - Section 61 Findings, *Continued*

**Mitigation Summary, continued**

| AREA OF CONCERN | IMPACT | MITIGATION MEASURE DESCRIPTION | SCHEDULE, COST & RESPONSIBILITY |
|---|---|---|---|
| **Wetland & Riverfront Areas** | Facility is located near wetland and riverfront areas. | The facility has been designed to minimize impacts to wetlands and riverfront areas by maximizing the use of existing infrastructure on site.<br><br>Impacts to wetlands and riverfront areas are limited to Phase 1 construction which is currently in progress. Permitting for Phase 1 construction is currently in progress. A Notice of Intent has been filed with the New Bedford Conservation Commission and is currently under review. The Notice of Intent includes the evaluation of various alternative designs and includes provisions for wetlands replication.<br><br>Phase 2 construction does not impact wetlands or riverfront areas of the site. Some minor activity will be within the buffer zone and a Notice of Intend will be filed regarding this activity.<br><br>The existing storm water management system on site will be modified as required to maintain compliance with the Massachusetts Stormwater Management Policy. | **Schedule:**<br>Mitigation measures for Phase 1 activity have been included in the NOI submitted to the Conservation Commission. Phase 2 designs will be included in the ATC application.<br><br>**Cost: $30,000**<br><br>**Responsibility:**<br>Phase 1: Site Design Engineer/Contractor/PPNE<br><br>Phase 2:<br>Site Design Engineer /Contractor/PPNE |

Continued on next page

# PPNE - Section 61 Findings, *Continued*

**Mitigation Summary, continued**

| AREA OF CONCERN | IMPACT | MITIGATION MEASURE DESCRIPTION | SCHEDULE, COST & RESPONSIBILITY |
|---|---|---|---|
| **Air Quality** | Facility operations could cause impacts to air quality | Facility is committed to:<br>• Keeping operations indoors<br>• Using electrically powered equipment<br>• Using an atomized water mist at multiple locations and a water spray when necessary to control dust for MSW operations<br>• Utilizing a biofilter and ionization system for odor control for biosolids operations<br>• Regular sweeping outdoors on the paved surfaces<br>• Paving all surfaces that are associated with facility operations<br>• Using an electrically powered rail car mover<br><br>The predicted air pollutant and odor concentrations are shown to comply with the applicable national and Massachusetts standards, and protective odor concentration criteria at residences, using the USEPA AERMOD model. This modeling demonstrates that the proposed project as designed does not cause or contribute to a condition of air pollution.<br><br>***Refer to the summary of the Air Quality modeling within the DEIR and to full Air Quality Impacts report in Attachment 14.*** | **Schedule:**<br>Design mitigation measures will be included in ATC application.<br>Mitigation measures will commence once controls are installed and/or instituted throughout the life of the project<br><br>**Cost: $250,000**<br><br>**Responsibility:**<br>Mitigation measures design by architect/engineers and PPNE<br>Operational requirements will be followed by PPNE |

Continued on next page

# PPNE - Section 61 Findings, *Continued*

**Mitigation Summary, continued**

| AREA OF CONCERN | IMPACT | MITIGATION MEASURE DESCRIPTION | SCHEDULE, COST & RESPONSIBILITY |
|---|---|---|---|
| **Nuisance Conditions** | Facility could pose nuisance conditions if not properly planed and/or operated. | The facility will be properly designed to significantly reduce the potential for on and/or off-site nuisance conditions:<br>**1. Sound:**<br>a. All waste handling will be within enclosed buildings<br>b. Tipping /delivery doors are away from surrounding receptors<br>c. Electric rail car mover will be used<br>d. Air handling units and fans will be low noise units or fitted with silencers<br>e. A noise wall will be constructed to reduce noise impacts of cooling towers<br>f. Onsite truck noise was modeled and determined to be below FHWA criteria for residences<br>**2. Litter**<br>a. Maintaining the tractor trailer entrance and exit doors in the closed position when not in use<br>b. Conducting all waste handling activities indoors<br>c. Covering the all trailers and containers after bulk loading and before leaving the building<br>d. Implementing a daily inspection program as a part of the Operations & Maintenance Program | **Schedule:**<br>Mitigation measures will be fully designed and will be included in ATC application.<br>Operation of the proposed mitigation measures during project will commence once installed and/or instituted throughout the life of the project.<br><br>**Responsibility:**<br>Mitigation measures design by architect/engineers and PPNE<br>Operational requirement will be followed by PPNE |

Continued on next page

# PPNE - Section 61 Findings, *Continued*

**Mitigation Summary, continued**

| AREA OF CONCERN | IMPACT | MITIGATION MEASURE DESCRIPTION | SCHEDULE, COST & RESPONSIBILITY |
|---|---|---|---|
| **Nuisance Conditions, continued** | Facility could pose nuisance conditions if not properly planed and/or operated. | **3 Dust**<br>a. Minimizing door openings within the proposed buildings<br>b. Minimizing cross-ventilation of air through the building by having the tipping door openings all on one side of the building<br>c. Conducting all waste handling activities indoors<br>d. Maintaining equipment on site that will remove the materials from the tipping floor for subsequent processing<br>e. Requiring all waste delivery vehicles to be covered<br>f. Sweeping the paved areas and building interiors<br>g. Use an atomizing misting system within MSW tipping areas<br>h. Use water to moisten loads as required to control dust<br><br>***Refer to the noise section of the DEIR and Attachment 13 for details of the noise modeling*** | **Schedule:**<br>Mitigation measures will be included as part of ATC application. Operation of mitigation measures during the project will commence once installed and/or instituted throughout the life of the project.<br><br>**Cost: $100,000**<br><br>**Responsibility:**<br>Mitigation measures design by architect/engineers and PPNE<br>Operational requirement will be followed by PPNE |

Continued on next page

# PPNE - Section 61 Findings, *Continued*

**Mitigation Summary, continued**

| AREA OF CONCERN | IMPACT | MITIGATION MEASURE DESCRIPTION | SCHEDULE, COST & RESPONSIBILITY |
|---|---|---|---|
| **Traffic Generation** | Based on limited traffic increases, the facility should develop a Transportation Demand Management System | • Providing opportunities for employees to participate in transit subsidy or reimbursement programs<br>• Informing employees of nearby transit stops and bicycle and pedestrian amenities<br>• Coordinate with SRTA to consider revising existing transit service to better service the project site<br>• Implementing a carpool system among employees<br>• Direct deposit offered to employees.<br>• Providing preferential parking for carpools and vanpools<br>• Providing incentives to encourage bicycle ridership to the site, such as bike racks and other storage facilities on site<br>• Providing striped bicycle lanes along Duchaine Boulevard and shared bicycle markings along Theodore Rice Boulevard to provide connectivity to the existing bicycle amenities along Braley Road. This is contingent upon City approval | **Schedule:**<br>Mitigation measures will be instituted during construction and will be on-going throughout the life of the facility<br><br>**Cost: $30,000**<br><br>**Responsibility:**<br>Mitigation measure through design or coordinated by architect/engineers and PPNE<br><br>Ongoing mitigation efforts will be followed by PPNE |
| **Threatened or Endangered Species** | The facility could impact threatened and/or endangered species | • According to MassGIS there is Priority Habitat of Rare Species and an Estimated Habitat of Rare Wildlife located approximately 1500 feet south of the site. These areas are separated from the site by the existing rail line. The siting of the facility will not have an adverse impact on Endangered, Threatened or Special Concern Species listed by the NHESP. | **Not Applicable** |

Continued on next page

# PPNE - Section 61 Findings, *Continued*

**Mitigation Summary, continued**

| AREA OF CONCERN | IMPACT | MITIGATION MEASURE DESCRIPTION | SCHEDULE, COST & RESPONSIBILITY |
|---|---|---|---|
| **Areas of Critical Environmental Concern** | The facility could impact an Area of Critical Environmental Concern | No Areas of Critical Environmental Concern (ACECs) were identified within on half mile of the site. | **Not Applicable** |
| **Historic or Archaeological Resources** | The facility could be sited in an area of historical or archaeological significance | No historical or archaeological sites of significance were identified on-site or in close proximity to the site. The controls proposed will ensure that impacts are mitigated and/or eliminated. | **Not Applicable** |
| **Build & Alternatives** | The development of the site or not seeking viable alternatives could yield potential impacts. | An Alternatives Analysis was prepared to provide an overview as to why the proposed site was the optimal choice for the proposed project.<br><br>A suitable site for the proposed project must be located adjacent to an active rail line and must meet all of the siting requirements of 310 CMR 16.00. This criteria limits the number of sites that are suitable for the proposed project.<br><br>Three sites were selected for comparison. Two of the sites were rejected due to the size of the site in one instance and traffic considerations for the other site. The selected site satisfied all the required site selection criteria.<br><br>***The full alternatives evaluation is included in the DEIR in the Project Description and Permitting Section.*** | **Not Applicable** |

Continued on next page

# PPNE - Section 61 Findings, *Continued*

**Mitigation Summary, continued**

| AREA OF CONCERN | IMPACT | MITIGATION MEASURE DESCRIPTION | SCHEDULE, COST & RESPONSIBILITY |
|---|---|---|---|
| **No Build Alternatives** | Not building the proposed facility could result in greater environmental benefits | Should the facility "NOT" be constructed, it is estimated that the following impacts could occur.<br>• Increased regional traffic counts (total mileage driven)<br>• Increased emissions associated vehicular emissions (more distant facilities)<br>• Potentially less recycling<br>• Increased greenhouse gas emissions | **Not Applicable** |
| **Construction** | During construction, the site could present impacts to the surrounding receptors and/or roadway networks. | The facility will be developed following controlled "construction" requirements and oversight. The facility shall take the following steps to mitigate impacts:<br>• Develop a SWPPP in association with the Order of Conditions.<br>• Make sure inbound and outbound vehicles utilize the major roadway networks surrounding the facility.<br>• Park all vehicles on-site during construction phases.<br>• Wet surfaces that may create nuisance dust conditions.<br>• Perform construction activities following local zoning ordinances and MA State Building code.<br>• Maintain proper on-site safety measures compliant with OSHA. | **Schedule:**<br>Phase 1 construction is in progress<br>Phase 2 construction will follow the receipt of the ATC permit<br><br>**Cost: $20,000**<br><br>A project cost estimate will be developed during final design of the project<br><br>**Responsibility:**<br>Construction Contractor/ PPNE |

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## PPNE - Section 61 Findings, *Continued*

**Cost of Mitigation**

The mitigation table presented above generally outlined costs associated with mitigation measures for the proposed project. However, it is expected that this project will cost approximately $50,000,000 to design and develop. The following is a list of features that are relevant with respect to mitigation:

- All waste handling activities conducted within the subject site buildings
- Indoors controls such as an atomizing dust/odor suppression system
- Electrically powered processing line (MSW & Baler)
- High-efficiency mechanical equipment & lighting
- VFDs where appropriate
- High-performance building envelopes
- Air handling units and fans will be low noise units or fitted with silencers
- A noise wall will be constructed to reduce noise impacts of cooling towers
- PV-Ready new construction
- Construction waste recycling
- Utilization of rail transport will reduce GHG by 60% when compared with the use of trucks
- Utilizing a biofilter and ionization system for odor control for biosolids operations
- Regular sweeping outdoors on the paved surfaces
- Paving all surfaces that are associated with facility operations top control dust
- Using an electrically powered rail car mover
- Providing opportunities for employees to participate in transit subsidy or reimbursement programs.
- Informing employees of nearby transit stops and bicycle and pedestrian amenities.
- Coordinate with SRTA to consider revising existing transit service to better service the project site.
- Implementing a carpool system among employees.
- Direct deposit offered to employees.
- Providing preferential parking for carpools and vanpools.
- Providing incentives to encourage bicycle ridership to the site, such as bike racks and other storage facilities on site.
- Storm water controls and BMPs for construction and ongoing operations
- Development of a SWPPP
- On-going O&M and inspection procedures

Continued on next page

## PPNE - Section 61 Findings, Continued

**Conclusion**

The proposed mitigation measures will be implemented in a timely manner following the approval of the proposed project. The mitigation measures presented are designed to avoid damage to the environment, comply with operational requirements to the greatest extent practicable, and mitigate the potential for on and off-site nuisance conditions. As such, the facility as proposed will not significantly impact the environment and surrounding potential receptors, and provides environmental benefits to the region.

Upon completion of the project, PPNE will submit a self-certification to the MEPA Office, prepared in accordance with the GHG Policy.

ATTACHMENT 19

ODOR, NOISE AND DUST COMPLAINT LOG

# Parallel Products - Complaint Logging Sheet

**Date:** ____________________ **Time:** ____________________

**Complainant Name:** ____________________

**Complainant Address:** ____________________

**Logged by (PPNE Staff Initials):** ____________________ **Complaint Type:** ☐Dust ☐Noise ☐Odor

**Wind Speed (MPH):** ____________________ **Wind Direction:** ____________________

**Temperature (F):** ____________________ **Relative Humidity:** ____________________

**Complaint Details:**

**Concurrent Operations Information:**

**Follow-Up:**

ATTACHMENT 20

DRAFT SPILL CONTINGENCY PLAN

# Spill Contingency Plan

**Introduction**

As part of a DEIR request, Green Seal Environmental, Inc. (GSE) has prepared this "DRAFT" Spill Contingency Plan (SCP). The SCP provides the reader with information pertaining to spills of oil, potentially hazardous, and/or hazardous materials at the proposed facility. It can be used as a guide for preventing unnecessary spills and to ensure that the proper steps have been taken when containing a release of a known or unknown material. It also provides general response procedures for clean up and/or reporting.

**Contact information**

The contact person(s) for the Parallel Products of New England, LLC (PPNE) facility is:

**To Be Determined** – General Manager
Phone Number: **To Be Determined**
Emergency Phone Number (Cell): **To Be Determined**

**Facility description**

The facility is located at 100 Duchaine Boulevard, New Bedford. The facility is zoned Industrial C. The facility is located within the New Bedford Business Park and was previously owned by Multilayer Coating Technologies and before that by Polaroid Corporation. The site was used by both previous owners to manufacture film.

The site as developed by Polaroid included access roads, parking areas, stormwater management features and numerous buildings. The site currently has approximately 16 acres of impervious surfaces consisting of access roads, buildings, parking lots, drive ways and concrete slabs on grade in areas where buildings were demolished.

Phase 1 development consists of building a glass Beneficiation operation at the 100 Duchaine Boulevard site and the construction of approximately 1.9 MW of solar power energy generation. The Phase 1 operation will recycle glass containers that are collected through the Massachusetts bottle deposit system. Phase 2 of the project includes the construction of a municipal solid waste (MSW) and construction and demolition waste (C&D) processing/handling facility and a biosolids processing facility.

*Continued on next page*

## **Spill Contingency Plan**, Continued

**Facility operations**

The following describes expected on-site operations:

- tipping, consolidation, processing and loading of MSW, C&D, and recyclable materials (glass and extracted recyclables),
- equipment maintenance,
- equipment repair when necessary,
- welding and cutting,
- storage of trucks and equipment, and
- equipment fueling from mobile fuel truck (potential).

**Spills**

Six procedures which help avoid and/or handle spills include:

| | |
|---|---|
| • Pre-planning | • Isolation |
| • Prevention | • Containment |
| • Identification | • Clean-up |

**Pre-planning**

Can spills happen? Can they be prevented? The answer to both questions is **Yes** (e.g. ruptured hydraulic hose on a piece of equipment). In most instances, pre-planning can prevent a spill from happening. In the event that a spill does occur, pre-planning will enable proper assessment and proper handling of the situation. By pre-planning, employees will know how to:

- notify the proper people if necessary,
- locate appropriate response materials, and
- provide a faster response time.

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## Spill Contingency Plan, Continued

**Prevention**

PPNE understands that not all spills and incidents can be avoided. However, some situations can be avoided through proper training of personnel. The following list contains some suggestions that will help PPNE avoid unnecessary spills:

- proper load inspections prior to tipping,
- no overfilling of vehicles and equipment with liquids and/or materials,
- performing daily inspections of the facility, and
- having the ability to properly identify potentially hazardous situations.

**Identification**

Identifying releases and/or potential releases is very important. Some ways in which you might identify these may include:

- training,
- being aware of your surroundings, and
- being able to identify warning signs (i.e. puddles, staining/sheens, or odors).

**Identifying the materials**

If you are aware of a release of oil or hazardous materials, the following steps should be taken.

| Step | Action |
|---|---|
| 1 | Note the appearance, color and odor of the released material while keeping a safe distance from the release. |
| 2 | Note the approximate size of the release. |
| 3 | Contact the Operations/Facility Manager for isolation, containment and clean-up instructions. |

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## **Spill Contingency Plan**, Continued

**Isolation**

After initial identification, the impacts from the release need to be minimized. Once the proper personal protective equipment (PPE) is donned, an exclusion area should be established. All personnel, materials and equipment, which have the potential of coming in contact with the materials, should be moved.

**Containment**

Once the released material has been evaluated and isolation measures completed, containment can commence by surrounding the release with a barrier to prevent migration. The containment area is considered the area within a barrier that contains spilled material. Examples of barriers are:

1. absorbent booms,
2. spill pillows,
3. wood chips,
4. vermiculite, and
5. sand.

These materials should be stored on-site during construction as well as during operation. Staff and sub-contractor should know where containment matrials are located.

**Containers**

The containers that will be used to store the "spent" absorbent materials and collected liquids will consist of D.O.T. approved 55-gallon drums and 85-gallon "over pack" drums. The drums are to be stored within the handling building and maintenance garage area along with absorbent materials and "spill kits". Full drums or containers are to be stored within the hazardous materials storage area for subsequent disposal.

*Continued on next page*

## **Spill Contingency Plan**, Continued

**Clean-up**

Once the release has been contained, steps can be taken to clean up the released material. Clean-up will consist of the following steps:

| Step | Action |
|---|---|
| **1** | Place absorbent materials around the release area to absorb free liquids. |
| **2** | Get the appropriate tools to pick up the material. |
| **3** | Get the appropriate container used to store the material prior to disposal. |
| **4** | Place all impacted materials into the appropriate container and seal it. |
| **5** | Decontaminate all equipment and tools that were used to clean up the release. |
| **6** | Place the sealed containers in the designated containment area within the maintenance building for subsequent disposal. |

**Mobile equipment**

Mobile equipment, yard trucks, and yard trailers will be owned and operated by PPNE. All the mobile equipment is planned to be diesel powered, with exception to railway push car(s) which will be electric. The total combined storage capacity of the mobile equipment is estimated to be less than 350-gallons, in aggregate at any given time. For the purpose of this SCP, the mobile equipment is considered a potential source of oil contamination. The Mobile Equipment Fueling and Inspections section of this document discusses the measures in place at PPNE to prevent a release of oil to the environment from mobile equipment.

*Continued on next page*

# Spill Contingency Plan, Continued

**Drainage controls**

PPNE shall implement the following controls to prevent a release of oil from impacting soil and groundwater at the facility:

- Maintaining absorbent materials for capturing a release of oil before it reaches the drainage system,
- an action plan to use the absorbent materials via manpower,
- installation of a tight tank to capture spills within the handling facility, and
- installation of stormwater treatment controls **(NOTE THAT FURTHER DETAIL WILL BE PROVIDED AS DESIGNS PROGRESS)**

**Drainage inspections**

The drainage controls described above allow the facility to monitor levels of oil in drainage control structures and prevent a release from entering the subsurface. The following procedures should be followed during the inspection process and prior to the discharging of liquids within any drainage structure.

| Step | Action |
|---|---|
| **1** | Inspect the asphalt-paved surfaces for signs of oil. |
| **2** | Inspect the catch basins for signs of oil. |
| **3** | Inspect drain line openings for signs of oil. |
| **4** | Inspect the drain manhole sumps for signs of oil. |
| **5** | Inspect the oil/water/sediment unit for signs of oil |
| **6** | Inspect the absorbent materials and re-stock as needed. |

If oil is identified at any of the inspection areas, refer to the following table.

| If… | Then… |
|---|---|
| a sheen of oil is observed during an inspection of the drainage components | note the sheen observed on an inspection form and attempt to locate the source of the sheen and correct, if possible (for example, runoff from asphalt, dripping oil line, leaking truck, etc.). |
| a measurable amount of oil (greater than ¼-inch) is observed during an inspection of any of the drainage components | determine where the oil is coming from and stop the oil from being released. Following the stoppage at the source, pump the oil out of the drainage component and place it in the waste oil tank for disposal. |

*Continued on next page*

## Spill Contingency Plan, Continued

**Container locations**

The following section discusses the oil storage containers and locations at PPNE. The locations where oil is stored at PPNE are:

- the mobile equipment fuel tanks or oil reservoirs, and
- the maintenance garage.

**Potential for spills**

The following table provides a summary of the potential spill area(s), estimated volumes and flow rates.

| Source | Failure Type | Volume (gallons) | Flow Rate (gallons per hour) | Flow Direction |
|---|---|---|---|---|
| Mobile equipment | Rupture, overfill, leakage | 100 | 50* | Depends on the location of the equipment at the time of release. |
| Maintenance area | Rupture, leakage | 100 | 55** | Contained within the maintenance garage |

Notes:
* = Assumes a release of oil from the largest oil storage tank on any given piece of mobile equipment.
** = Assume only one 55-gallon drum is compromised

**(NOTE THAT FURTHER DETAIL WILL BE PROVIDED AS DESIGNS PROGRESS)**

*Continued on next page*

## **Spill Contingency Plan**, Continued

**Container inspections**

The oil storage containers described above should be inspected on a weekly basis for leaks, spills and/or staining. The following procedures should be followed during the inspection process and prior to the discharging of liquids within any drainage structure.

| Step | Action |
|---|---|
| **1** | Inspect each location for signs of oil leaks, spills and/or stains. |
| **2** | Document leaks and/or spills. |
| **3** | Report the outcome of the inspection to the Operations Manager. |
| **4** | Correct identified problems. |
| **5** | Contact Environmental Response Contractor and Licensed Site Professional (if necessary)<br>Environmental Response Contractor: **To Be Determined**<br>**To Be Determined**<br>**To Be Determined**<br><br>Licensed Site Professional: GSE<br>508-888-6034 |

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## **Spill Contingency Plan**, Continued

**What to do**

If oil is identified outside of the containers at any of the inspection points, refer to the following table.

***NOTE: Pursuant to the Massachusetts Contingency Plan (310 CMR 40.0000), a release of oil greater than 10-gallons in size must be reported to MassDEP within 2 hours.***

| If… | Then… |
| --- | --- |
| a stain of oil is observed during an inspection… | note the stained area and inform personnel that oil transfer activities should be conducted more carefully in the future. |
| a spill of oil is observed (measurable amount of oil greater than ¼-inch in thickness or less than 10-gallons) during an inspection of any of the containers… | note the spill on an inspection form. Determine where the oil came from (overfill, spill, leak). Put on the appropriate personal protective equipment (PPE). Clean up the spill using absorbent materials, shovels, etc. Place the used absorbent materials in a DOT approved 55-gallon drum for later disposal. Report the spill to the Operations Manager. The Operations Manager will make all the necessary reports as deemed applicable (e.g. MassDEP). |
| a spill of oil is observed, (measurable amount of oil greater than ¼-inch in thickness or greater than 10-gallons) during an inspection of any of the containers… | notify the Operations Manager and note the spill on an inspection form. Determine where the oil came from (overfill, spill, leak). Put on the appropriate PPE. Clean up the spill using absorbent materials, shovels, etc. Place the used absorbent materials in a DOT approved 55-gallon drum for later disposal and report the spill to the facility manager. The Operations Manager will make all the necessary reports as deemed applicable (e.g. MassDEP). |
| a leak of oil is observed during an inspection of a container… | document the leak source and amount. Report the leak to the Operations Manager. Put on the appropriate PPE and clean up the spill using absorbent materials, shovels, etc. Fix the leaking container, if possible. Place the used absorbent materials in a DOT approved 55-gallon drum for later disposal and report the spill to the Operations Manager. The Operations Manager will make reports as necessary. |
| the leak cannot be fixed immediately… | pump the contents of the container into another container(s) and have the leaking container repaired or replaced. |

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## **Spill Contingency Plan**, Continued

**Mobile equipment**

Mobile equipment at the facility is inspected on a daily basis prior to start up for appropriate fluid levels and possible leaks. The following table identifies the protocols for inspecting mobile equipment for leaks and what to do if a leak is identified.

| Step | Action |
|---|---|
| **1** | Inspect the machinery for appropriate fluid levels. |
| **2** | Identify leaks and/or spills of oil. |
| **3** | Repair the leak source and/or clean up oil prior to start up. |
| **4** | Report leaks or spills to the Operations Manager. |
| **5** | Dispose of oil and/or absorbent materials in a DOT approved 55-gallon drum. |
| **6** | Label the drum and send it to a facility licensed to accept oily waste. |

**Overfill prevention**

Even though overfilling is not expected, PPNE wants all employees and subcontractors to be aware that a release of liquids could cause impacts to the facility and the surrounding environment.

**Common sense**

By using common sense and following the basic guidelines below, PPNE can prevent unnecessary spills and/or leaks. Use the following precautions:

- do not top off any vehicle or piece of equipment with fuel,
- if there is a small amount of liquid left, use it later instead of trying to fill a container or use it up,
- do not leave the vehicle, equipment or machinery unattended while fueling,
- have a towel, rag or some type of absorbent material nearby in case of accidental overfilling, and
- TAKE YOUR TIME TO ENSURE THAT THERE ARE NO SPILLS!!!

These basic common sense action steps will save PPNE time and unnecessary clean up costs in the future. Additionally, even small stains from overfilling are indicative of poor overall housekeeping practices to environmental professionals and regulators who periodically inspect the facility.

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## **Spill Contingency Plan**, Continued

**Mobile equipment fueling**

When fueling mobile equipment at PPNE, several precautions should be taken.

1. Do not "top off" equipment.
2. Take the appropriate precautions when filling the fuel tank to prevent a spill (i.e. don't walk away from the equipment while fueling).
3. If deemed appropriate, place a "spill mat" over the nearest down-gradient catch basin to prevent a release of oil from entering the catch basin system.

**Small spills and leaks**

If a piece of mobile equipment has a **"small"** spill or leak of oil (less than 10 gallons of oil, one gallon of gasoline) that is *easily managed*, the following steps should be taken:

| Step | Action |
|---|---|
| **1** | Shut down the equipment. |
| **2** | Identify the source of the spill. |
| **3** | Stop the release from spreading. |
| **4** | Notify the Operations Manager. |
| **5** | Clean up the spill from around the machinery or release area. |
| **6** | Repair the spill or leak source. |

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## **Spill Contingency Plan**, Continued

**Large spills and leaks**

If a piece of mobile equipment has a **"large"** spill or leak of oil (greater than ten gallons of oil or 1 gallon of gasoline) that is *not easily managed*, the following steps should be taken:

| Step | Action |
|---|---|
| **1** | Shut down the equipment. |
| **2** | Identify the source of the release. |
| **3** | "Dam up" the spill around the machinery or release area using absorbent materials, shovels, etc. |
| **4** | Notify the Operations/Facility Manager of the incident. |
| **5** | Contact the appropriate contractor to assist with responding to the release. |
| **6** | The Operations/Facility Manager will notify the Fire Department, MassDEP and the US EPA as deemed applicable. |

**Absorbent materials**

Absorbent and containment-type materials shall be maintained on-site in case of an accidental liquid release.

**Locations**

One "spill kit" is located inside the designated maintenance area in close proximity to the oil storage area. The spill kit shall contain absorbent materials and other spill equipment. The spill kit is clearly labeled and can be readily moved to any location on-site. The second spill kit will be maintained **(TO BE DETERMINED)**

These materials can be used to clean up small to medium-size spills of oil or liquid hazardous materials. The absorbent materials consist of:

| | |
|---|---|
| • Speedi-dri ® | • absorbent booms |
| • absorbent pads | • mops |
| • brooms | • shovels |

*Continued on next page*

## **Spill Contingency Plan**, Continued

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**Spill reporting**

In the unlikely event that a release of oil or hazardous material occurs at the facility, use the following form to document the event. The form is not an official form, but will help you document actions soon after the event has occurred.

---

**Environmental incident report**

Fill out the sections below if applicable.

Date of release_________________________ Spill [ ] Leak [ ]

Location (give details)_____________________________________________
_________________________________________________________________

Material released ____________________ Quantity ____________________

Source of release (if known)
_________________________________________________________________

Reason__________________________________________________________

Amount recovered_______________ Fully recovered yes [ ] no [ ]

Disposal method _________________________________

Preventative measures taken ________________________________________
_________________________________________________________________

Comments________________________________________________________
_________________________________________________________________

(The Operations Manager must review all entries)

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ATTACHMENT 21

COMMUNITY OUTREACH

Date: October 17th, 2019
Re: Parallel Products Community Outreach Efforts

Parallel Products has conducted efforts to educate the community on their plans for the new site at 100 Duchaine Boulevard in the New Bedford Business Park and address any questions or concerns they may have.

Parallel Products has gone door to door with fact sheets and comment cards with pre-paid postage (see Figure 1) to receive community input on the new site. Parallel Products' Community Outreach team has knocked on a total of 1,390 doors.

We welcome your comments and questions regarding the Parallel Products Green Energy Center. Parallel Products is committed to New Bedford and will directly address any concerns you may have. We intend to continue being a good and respectful neighbor and want to maintain an open dialogue with the community.

Name: ______________________________

Address: ______________________________

New Bedford, MA Zip Code: __________ Email: ______________________________

Comment: ______________________________

www.parallelproductssustainability.com

*Figure 1*

Parallel Products has knocked on 900 unique doors closest to the new site in the New Bedford Business Park. Each home received a comment card and fact sheet unless they refused. The Pine Hill Acres neighborhood, which consists of 360 homes, received a second visit from a Parallel Products representative, as they reside closest to the new site. Parallel Products representatives have also knocked on the 75 closest homes near their current site at 969 Shawmut Avenue and an additional 54 homes throughout New Bedford to educate the community about their plans for 100 Duchaine Boulevard and assess if the neighbors have had any complaints over the past 11 years.

To this date, Parallel Products has received 12 comment cards and has sent a response to all that have an address listed for return. All of the cards and their responses can be found in Appendix A.

Parallel Products has also conducted 22 visits or meetings to key business stakeholders in the community and local vendors. Parallel Products held a public meeting at the Pulaski School on April 29, 2019. This meeting was advertised on radio, Facebook, as well as multiple publication dates in the Standard Times. On July 24th, 2019, Parallel Products hosted its future neighbors in the Business Park for a meeting. Every company in the Business Park received notices via email in advance of the meeting and 5 individuals attended.

Parallel Products plans to continue its community outreach efforts moving forward, including hosting two public meetings on December 3rd and December 4th of 2019. The Community Outreach team has reached out to the key Environmental Justice Community Group Leaders identified by MEPA to find a convenient location and time. Parallel will provide MEPA and the local community with the details when they are confirmed in the coming weeks. The meetings will be advertised on the website, www.parallelproductssustainability.com, social media, and will provide notice in the Standard Times newspaper as well as Spanish and Portuguese publications, per MEPA recommendations.

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