Landfill Designs and Closure Plans

ADEC Solid Waste Program

Trench and Fill

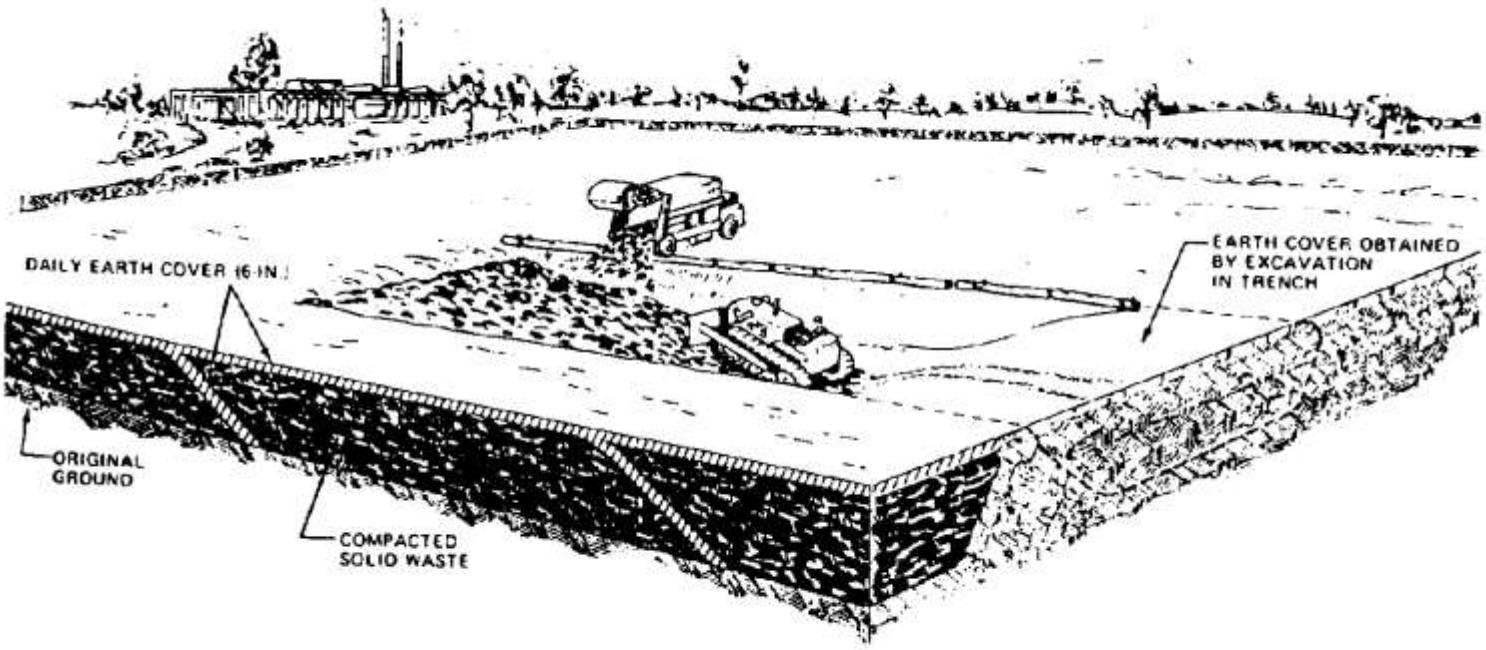
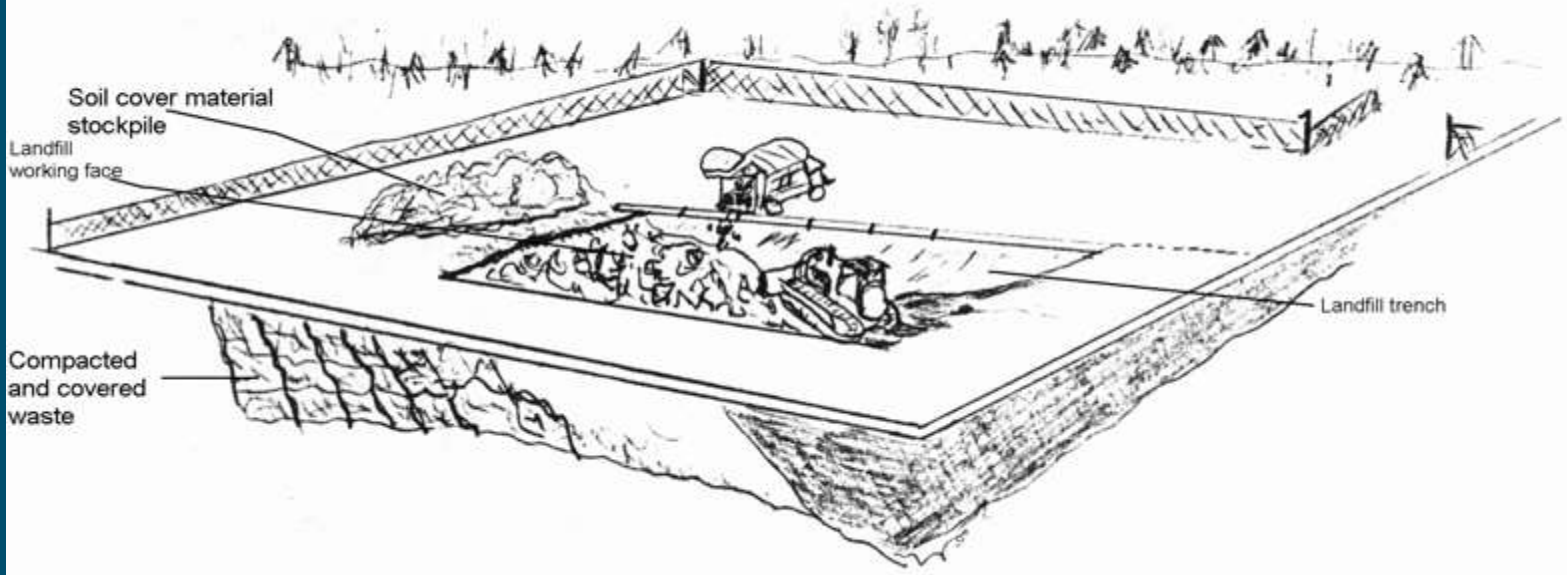
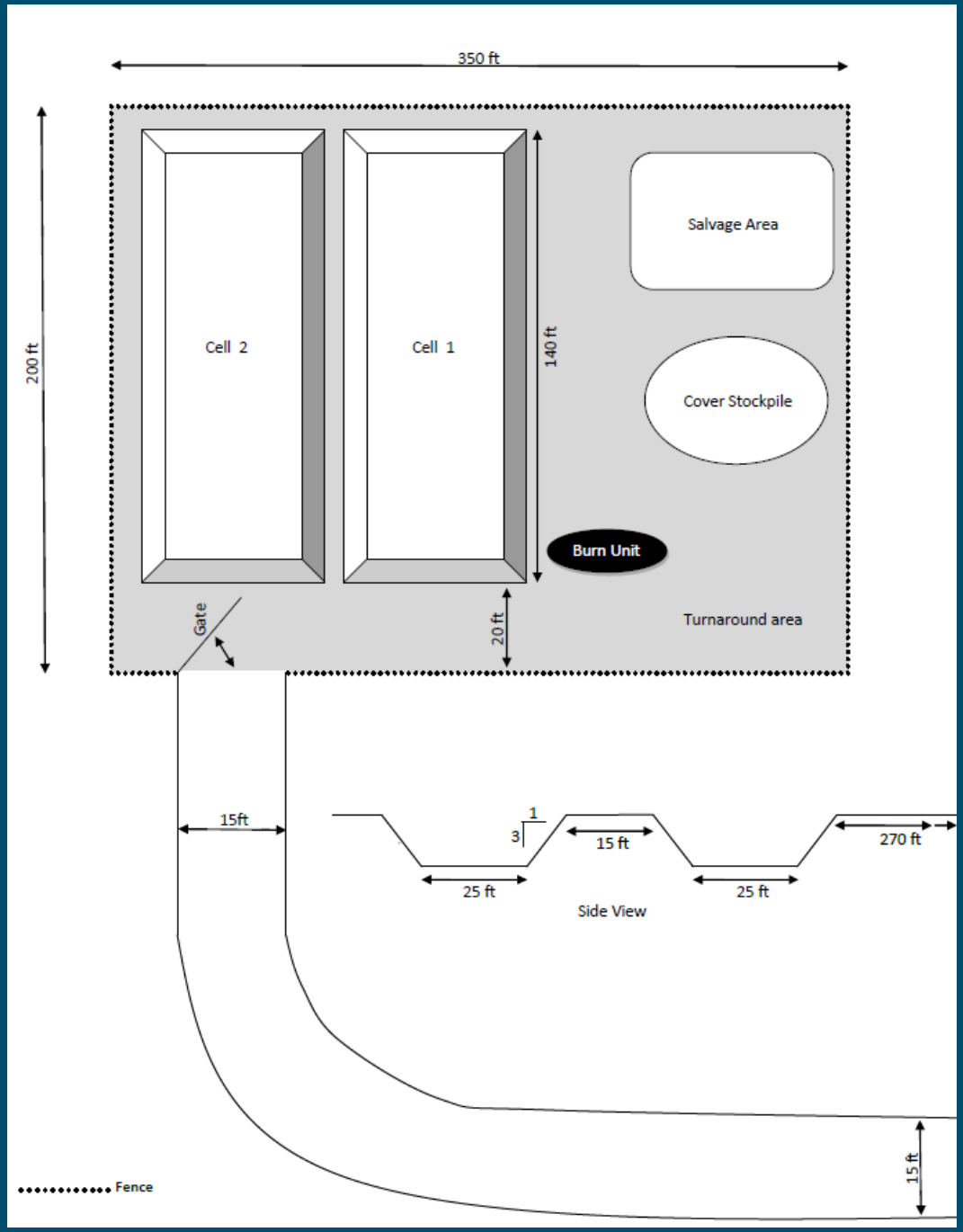


Figure 2–1. Typical Trench Landfill Operation.

Trench and Fill

Figure 1. Trench and fill.




350 ft
200 ft
Cell 2
Cell 1
140 ft
Salvage Area
Cover Stockpile
Burn Unit
Gate
20 ft
Turnaround area
15ft
1
3
15 ft
270 ft
25 ft
25 ft
Side View
15 ft
Fence


06.03.2013

Key Elements of a Trench and Fill

- Generates it's own cover material
- A traditional trench and fill design is at ground level.
- You can close it as you go

New Terms:
GS: ground surface, aka at grade
BGS: below ground surface, below grade
AGS: above ground surface, above grade
Usually, the only time you will see these terms is on engineering drawings

Traditional T&F to Above Ground T&F

Above Ground Trench and Fill


09.24.2018


PLEASE
CLOSE GATE
Stevens Village Landfill
TEMPORARY
STORAGE
AREA


DO NOT BURN
OPEN BURNING
PROHIBITED

Above Ground Trench & Fill Key Elements

- Same concept as a normal trench and fill, but built up. Multiple reasons for this- permafrost, wetlands, etc.
- Important differences:
  - Does not always generate it's own cover material. Be sure to start out with cover material and have a plan to get more, if you construct a similar design as Stevens Village.
  - Is more expensive to construct, operate and maintain than a traditional trench and fill landfill. However, it can be a better option than an area fill design for many areas.

Area Fill

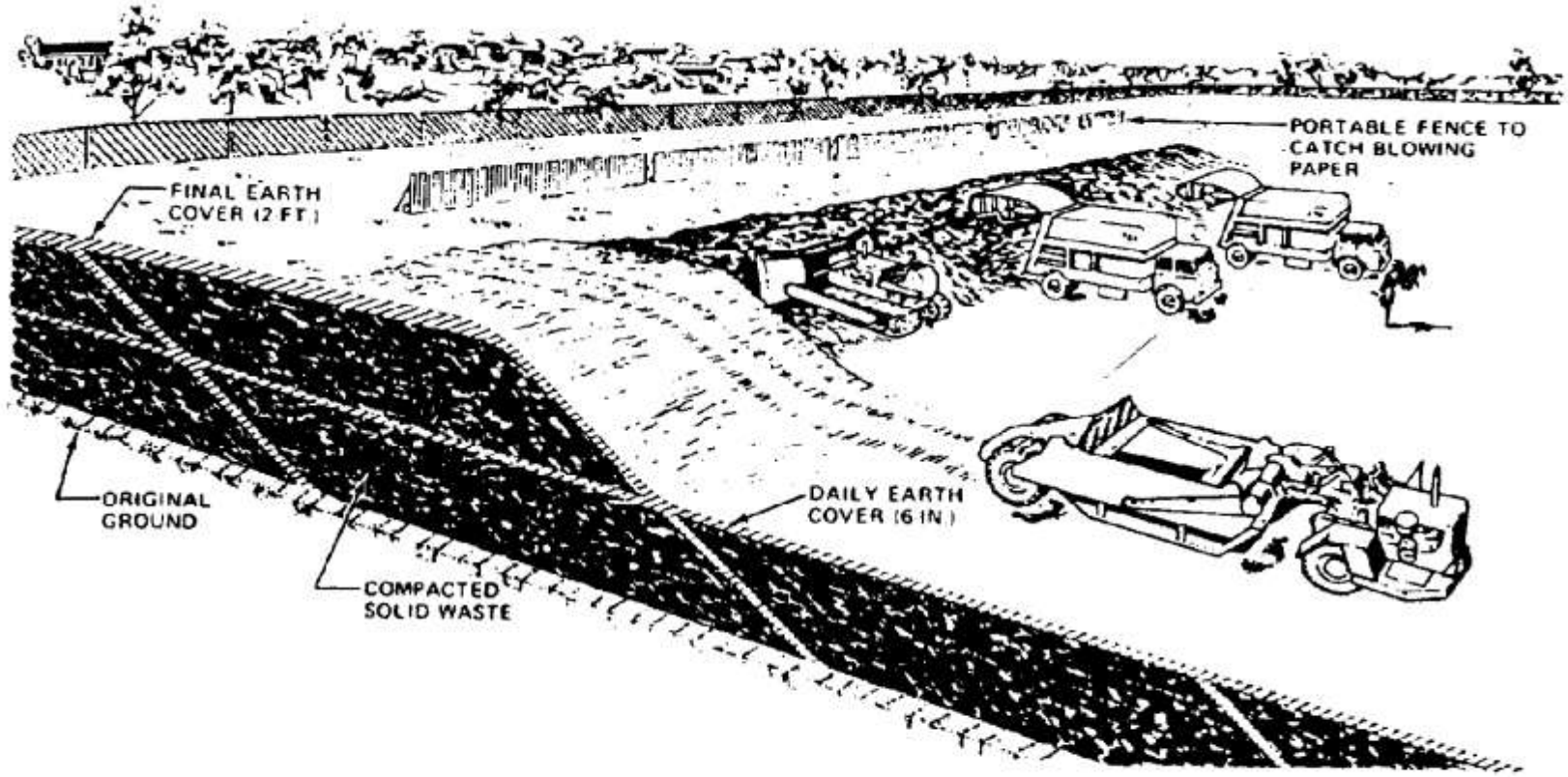
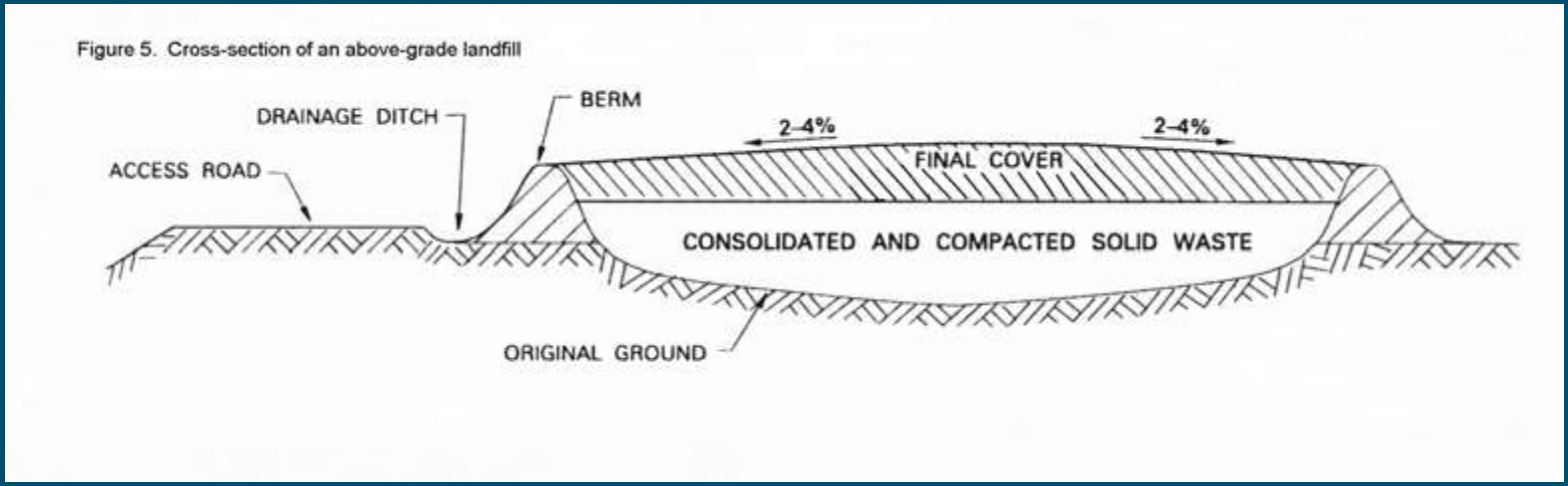


Figure 2–2. Typical Area Landfill Operation.

Area Fill Key Concepts

- This is the most likely landfill design to get out of control
- Berms, fence, and cover material are some of the elements that would help this design stay controlled.
- It is advised to close sections of this landfill design type as you go
- This design almost always requires heavy equipment to keep it clean.

Above Ground Area Fill




08.28.2014


2015. 6. 20


08.08.2017 11:37

Above Ground Area Fill Key Concepts

- Very similar to a traditional area fill, but always has berms. This is contain the wastes. Some operation plans utilize the berms to compact wastes against.
- Often utilized in areas with permafrost and wetlands.
- It is important to have a stockpile of cover material available for regular operation and maintenance.

Below Ground Area Fill

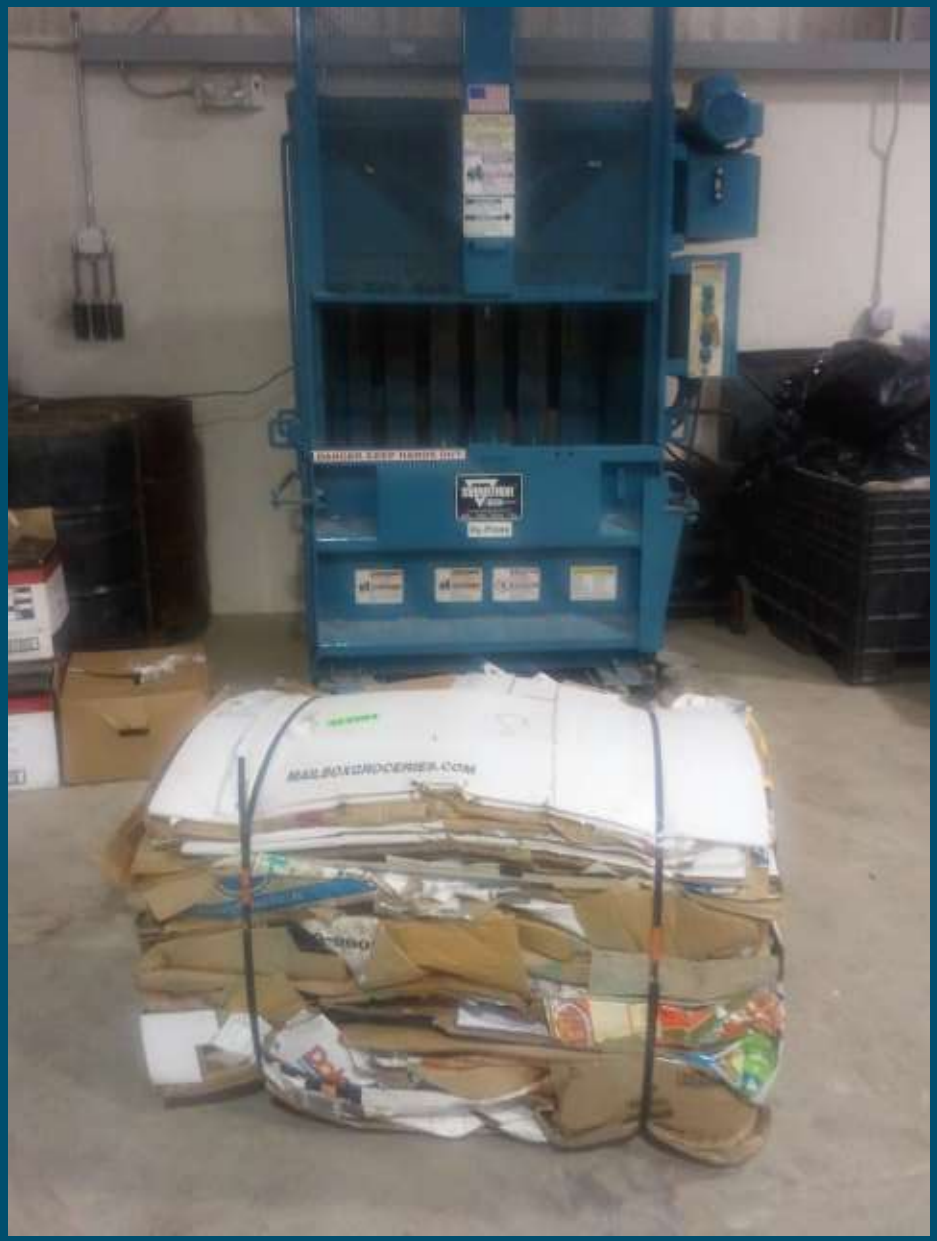
Below Ground Area Fill

Below Ground Area Fill Key Concepts

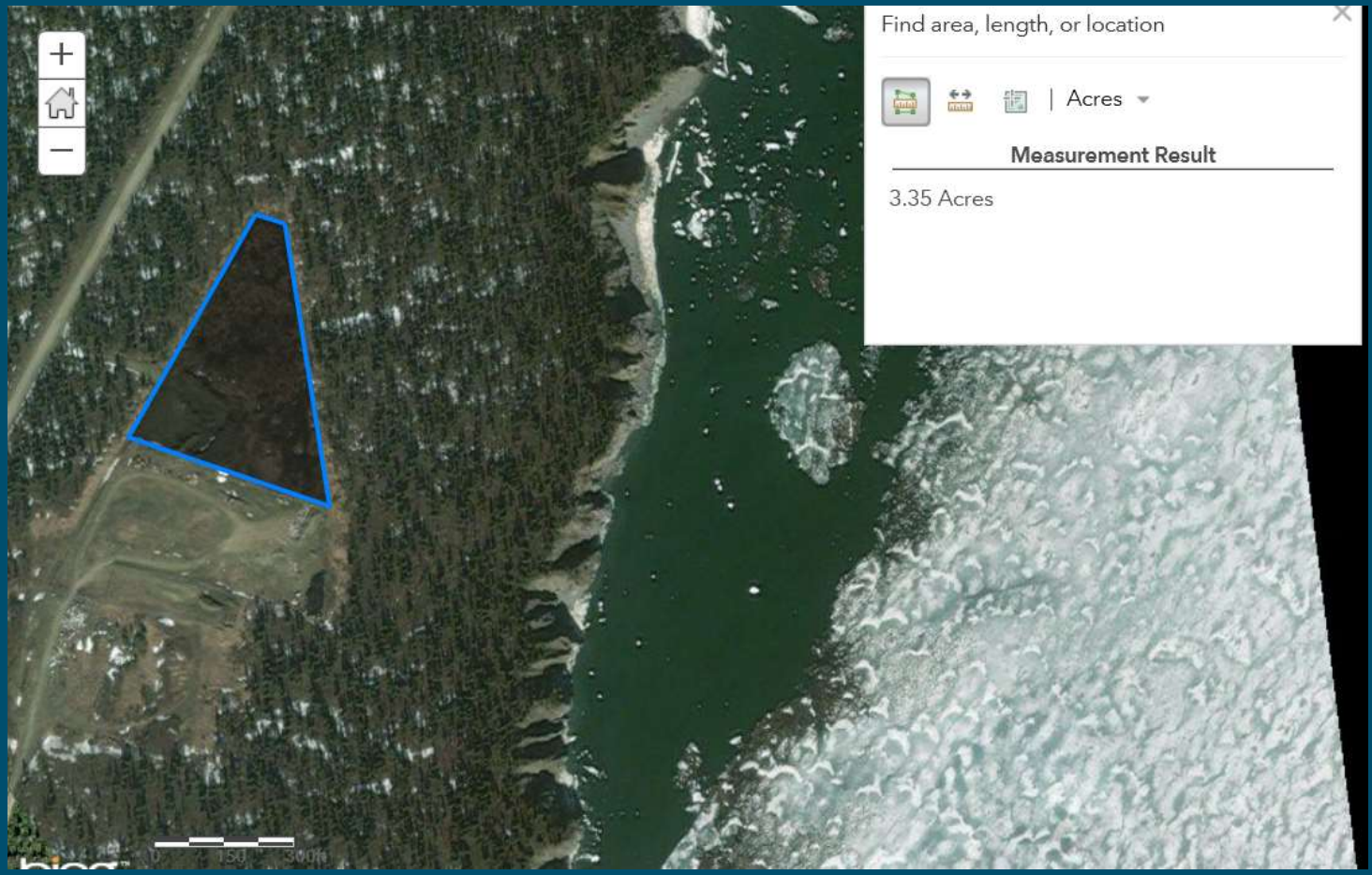
- Very similar to a traditional area fill, but always has berms. This is contain the wastes. Some operation plans utilize the berms to compact wastes against.
- Often utilized in areas where construction is planned on high ground, like a hill or mountain where groundwater is deep.
- It is important to have a stockpile of cover material available for regular operation and maintenance.
- Water management is critical in these landfills.
- Requires regular application of cover.

Balefill

Balefill



Lateral Expansion Area




Cleared area being prepared. This is Cell 3. Cell 2 will be closed and used for salvage area. It is not as large as Cell 2, so Cell 3 cannot accommodate all the components of the Elim landfill. Cell 2 will not be revegetated because it will continue to be an active part of the facility, just not for waste disposal.
Separately Fenced Cell 2- almost full
Separately Fenced Honeybucket/Septage Trench
Cell 1- Closed
Image © 2016 DigitalGlobe
Image © 2016 TerraMetrics
Google earth
Imagery Date: 6/13/2012 64°38'47.70" N 162°13'12.87" W elev 145 ft eye alt 3415 ft

Example of a Lateral Expansion

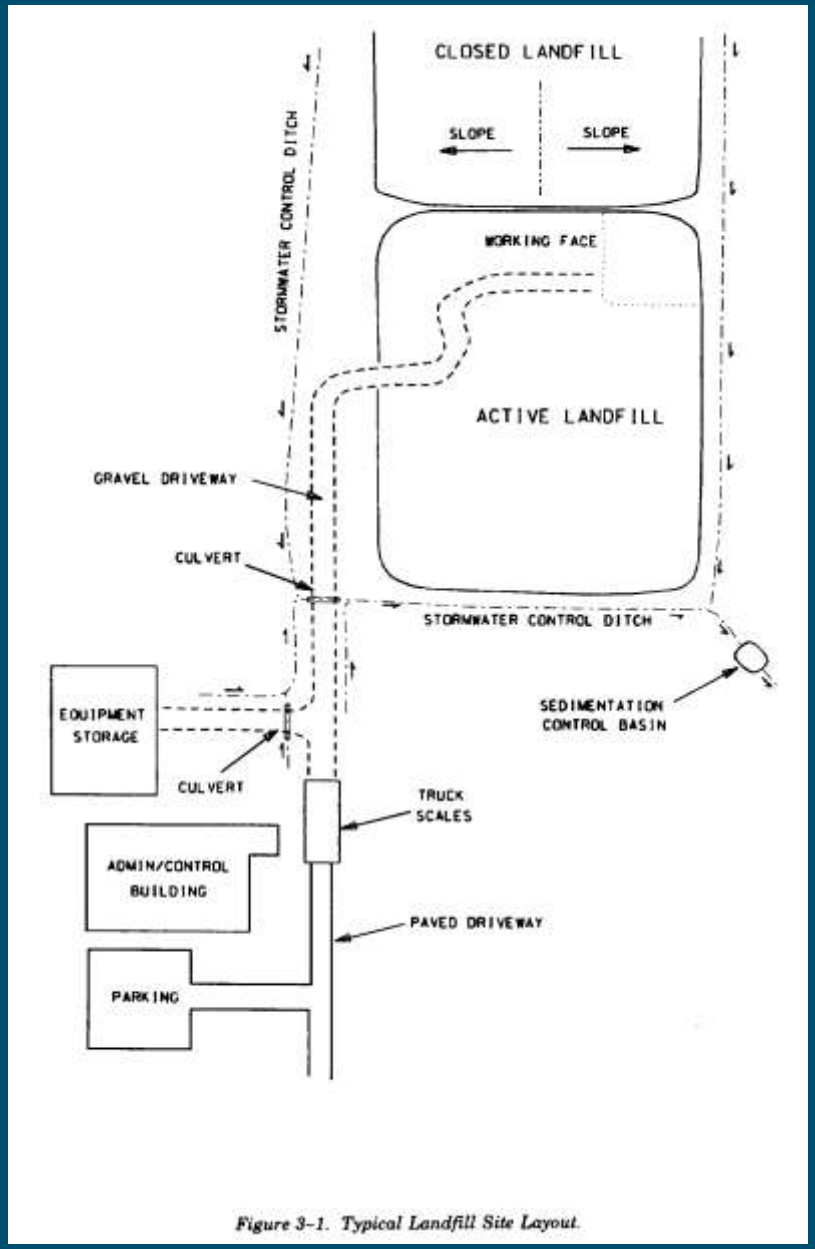
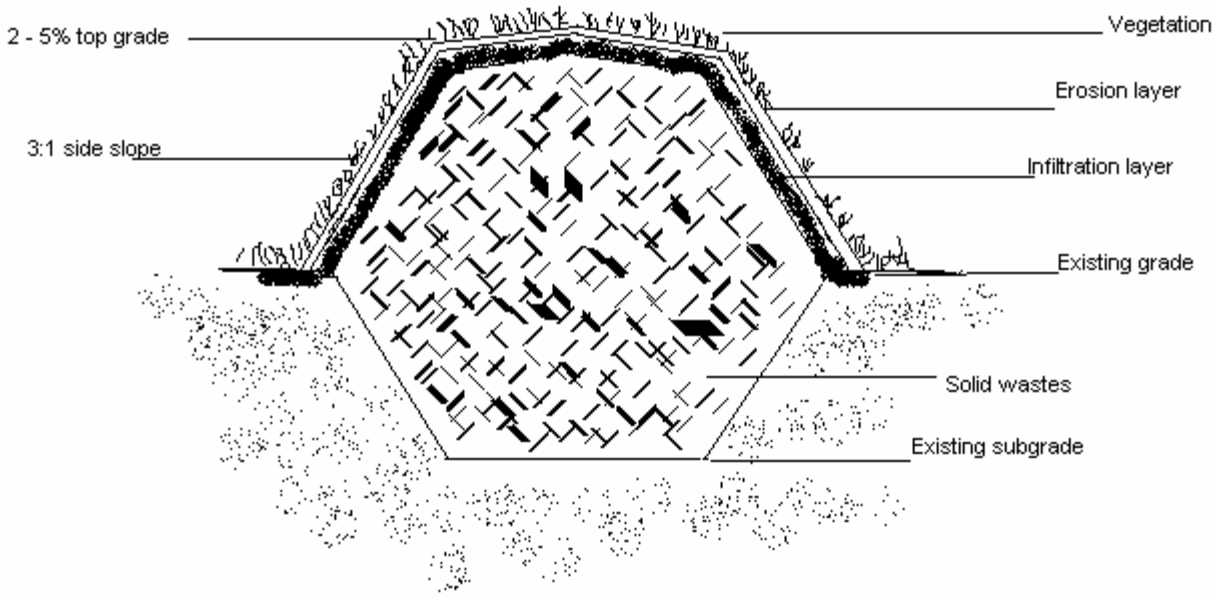


Figure 3-1. Typical Landfill Site Layout.

Closure

Figure 17. Landfill cover (cap) design.



Landfill Design Can Impact Closure

Landfill Design Can Impact Closure

- Trench and Fill
- Above Ground Trench and Fill
- Area Fill
- Above Ground Area Fill
- Balefill

Closure Process

- **Conceptual to Actual Closure Plan**
- **Proposal/Notification to ADEC**

- Main steps:
  - Consolidate litter.
  - Cover waste with 2ft of approved cover material.
  - Grade and slope to promote water run-off/diversion without causing erosion.
  - Fertilize and seed the area.
  - Notify Recorder's Office of Closure
  - Notify ADEC in writing that the Landfill is closed.
  - Enter the post-closure period (5 years)
  - Perform annual post-closure inspections
  - After 5 years, submit written request for termination of post-closure responsibility to ADEC.

Success!

Success!

Close-Up….What Do You See?


WARNING
NO TRESPASSING
PREVIOUS
LANDFILL SITE

PHOTO A: EXISTING CONDITION OF PARTIALLY CLOSED DUMP

EXISTING DUMP CLOSURE NOTES:

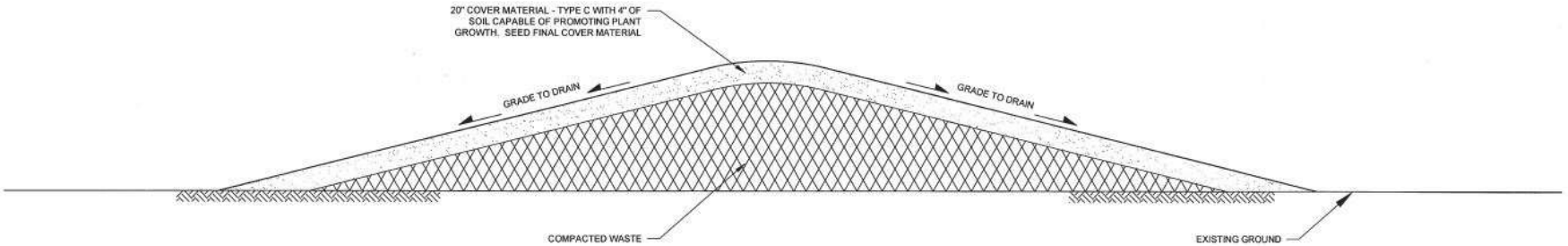
1. COLLECT LOOSE LITTER AND PLACE IT IN THE WASTE DISPOSAL AREA.
2. "POT-HOLE" AREAS AROUND THE PERIMETER OF THE EXISTING DUMP TO DETERMINE THE EXTENTS OF THE DUMP AREA.
3. CONSOLIDATE AND COMPACT WASTE.
   - 3.1. CONSOLIDATE WASTE INTO AS SMALL OF A FOOTPRINT AS PRACTICAL.
   - 3.2. SHAPE WASTE PILE INTO A UNIFORMLY SHAPED MOUND.
   - 3.3. COMPACT WASTE WITH LARGEST DOZER AVAILABLE.
   - 3.4. GRADE THE COMPACTED WASTE SO THAT THE PILE HAS A SLOPE OF AT LEAST 2% IN ALL DIRECTIONS.
   - 3.5. REMOVE ANY VISIBLE HAZARDOUS WASTE IDENTIFIED DURING THE CONSOLIDATION AND COMPACTION PROCESS.
   - 3.6. SHIP ANY RECOVERED HAZARDOUS WASTE TO A FACILITY THAT ACCEPTS HAZARDOUS WASTE.
4. COVER THE ENTIRE DUMP AREA WITH AT LEAST 20 INCHES OF EARTHEN MATERIAL. BECAUSE OF THE IRREGULAR SHAPE OF COMPACTED WASTE, ADDITIONAL FILL WILL BE REQUIRED IN MANY AREAS.
5. GRADE THE COVER MATERIAL AT A SLOPE OF 2-3% TO DRAIN AWAY FROM THE DUMP.
6. ADD AT LEAST 4 INCHES OF SOIL OVER GRAVEL AREAS, TO PROMOTE PLANT GROWTH. THE TOTAL COVER SHOULD BE AT LEAST 24 INCHES THICK.
7. SPREAD FERTILIZER AND SEED OVER THE ENTIRE COVERED LANDFILL AREA.
8. POST SIGN AT THE FACILITY INFORMING THE PUBLIC THAT THE DUMP IS CLOSED.
9. INSTALL REBAR MARKERS AT CORNERS OF THE DUMP.
10. SURVEY THE LIMITS OF THE DUMP AND RECORD THIS WITH THE STATE RECORDER'S OFFICE.

95% Submittal

WHPacific

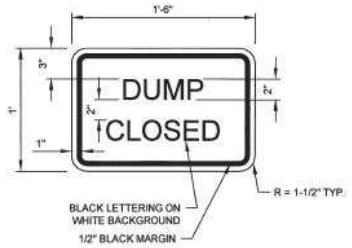
STEVENS VILLAGE LANDFILL
NATIVE VILLAGE OF STEVENS
EXISTING DUMP CLOSURE PLAN

C-10



A C-11 **SECTION A - A**
SCALE: 1"=5'

GENERAL SIGN NOTES:
REFER TO ADOT&PF STANDARD DRAWINGS S-00.10, S-01.00, AND S-30.03 FOR POST AND BRACING DETAILS



1 C-11 **SIGN E**
SCALE: 1"=5"

95% Submittal

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350 West 21st Avenue
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907-339-5500 Fax 907-339-5537
www.whpacific.com

REVISIONS & ADDENDUMS

#	DATE	REMARKS

MANAGEMENT	
DESIGNED	BEC
DRAWN	BEC
CHECKED	BEC
APPROVED	BEC
LAST EDIT	3/28/11
PLOT DATE	3/28/11
SUBMITTAL	

STEVENS VILLAGE LANDFILL
NATIVE VILLAGE OF STEVENS
EXISTING DUMP DETAILS

PROJECT NUMBER: 5299
DRAWING FILE NAME: C-11_SECTIONS-DETAILS.DWG
DRAWING SCALE: AS SHOWN

SHEET NUMBER
C-11

2006

2003

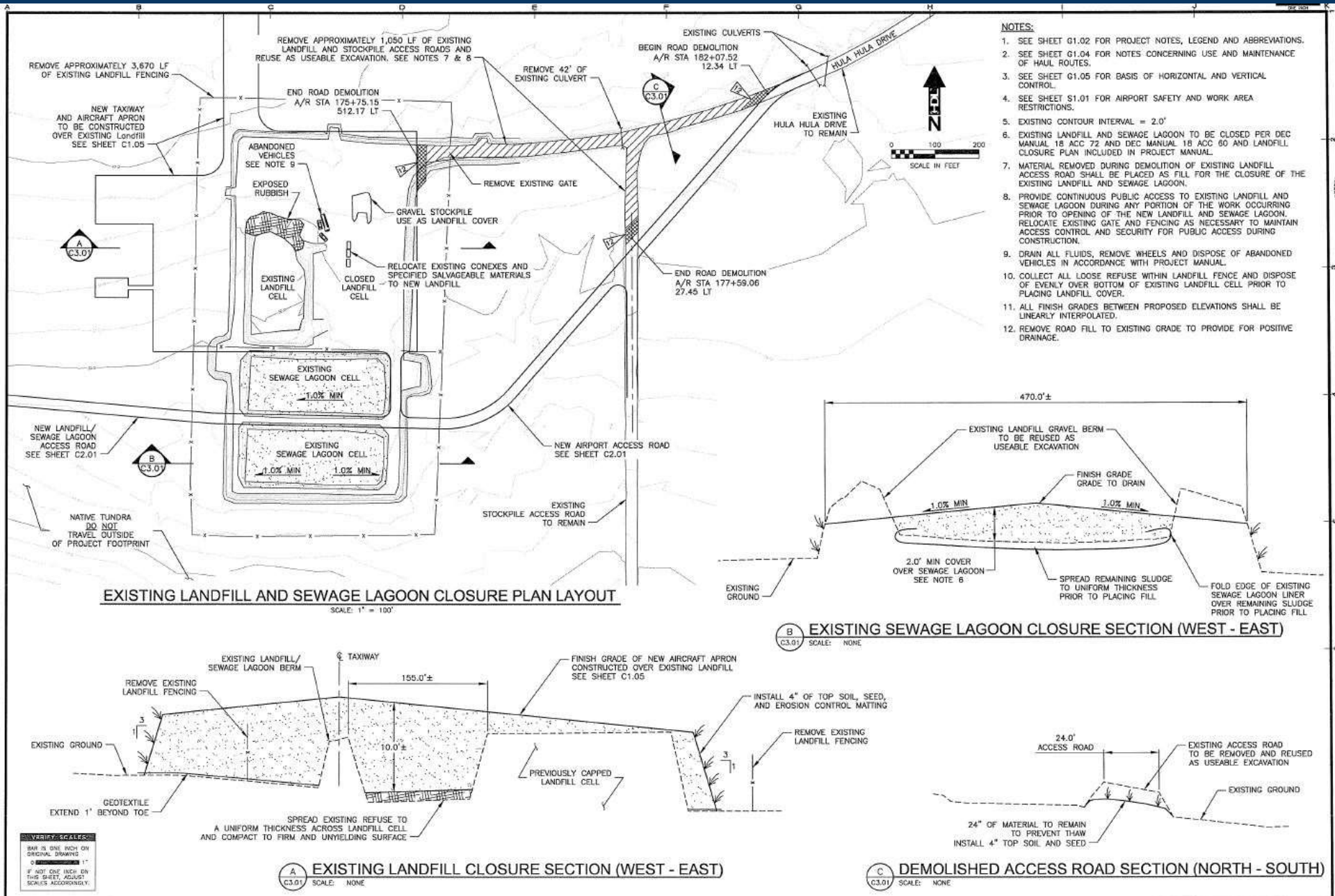
2009

Alternative Closure Ideas

- Airport
- Ball Field
- Land Farm for Polluted Soils

Kaktovik


EXISTING AIRPORT
TO BE DECOMISSIONED
NEW AIRPORT
NEW LANDFILL AND
SEWAGE LAGOON
100 YEAR FLOOD
ELEVATION 6.7 FEET MSL
ESTIMATED FROM USGS
QUADRANGLE AND
SATELLITE PHOTO



EXISTING LANDFILL AND SEWAGE LAGOON CLOSURE PLAN LAYOUT

SCALE: 1" = 100'

NOTES:

1. SEE SHEET G1.02 FOR PROJECT NOTES, LEGEND AND ABBREVIATIONS.
2. SEE SHEET G1.04 FOR NOTES CONCERNING USE AND MAINTENANCE OF HAUL ROUTES.
3. SEE SHEET G1.05 FOR BASIS OF HORIZONTAL AND VERTICAL CONTROL.
4. SEE SHEET S1.01 FOR AIRPORT SAFETY AND WORK AREA RESTRICTIONS.
5. EXISTING CONTOUR INTERVAL = 2.0'
6. EXISTING LANDFILL AND SEWAGE LAGOON TO BE CLOSED PER DEC MANUAL 18 ACC 72 AND DEC MANUAL 18 ACC 60 AND LANDFILL CLOSURE PLAN INCLUDED IN PROJECT MANUAL.
7. MATERIAL REMOVED DURING DEMOLITION OF EXISTING LANDFILL ACCESS ROAD SHALL BE PLACED AS FILL FOR THE CLOSURE OF THE EXISTING LANDFILL AND SEWAGE LAGOON.
8. PROVIDE CONTINUOUS PUBLIC ACCESS TO EXISTING LANDFILL AND SEWAGE LAGOON DURING ANY PORTION OF THE WORK OCCURRING PRIOR TO OPENING OF THE NEW LANDFILL AND SEWAGE LAGOON. RELOCATE EXISTING GATE AND FENCING AS NECESSARY TO MAINTAIN ACCESS CONTROL AND SECURITY FOR PUBLIC ACCESS DURING CONSTRUCTION.
9. DRAIN ALL FLUIDS, REMOVE WHEELS AND DISPOSE OF ABANDONED VEHICLES IN ACCORDANCE WITH PROJECT MANUAL.
10. COLLECT ALL LOOSE REFUSE WITHIN LANDFILL FENCE AND DISPOSE OF EVENLY OVER BOTTOM OF EXISTING LANDFILL CELL PRIOR TO PLACING LANDFILL COVER.
11. ALL FINISH GRADES BETWEEN PROPOSED ELEVATIONS SHALL BE LINEARLY INTERPOLATED.
12. REMOVE ROAD FILL TO EXISTING GRADE TO PROVIDE FOR POSITIVE DRAINAGE.

B C3.01 EXISTING SEWAGE LAGOON CLOSURE SECTION (WEST - EAST)

SCALE: NONE

A C3.01 EXISTING LANDFILL CLOSURE SECTION (WEST - EAST)

SCALE: NONE

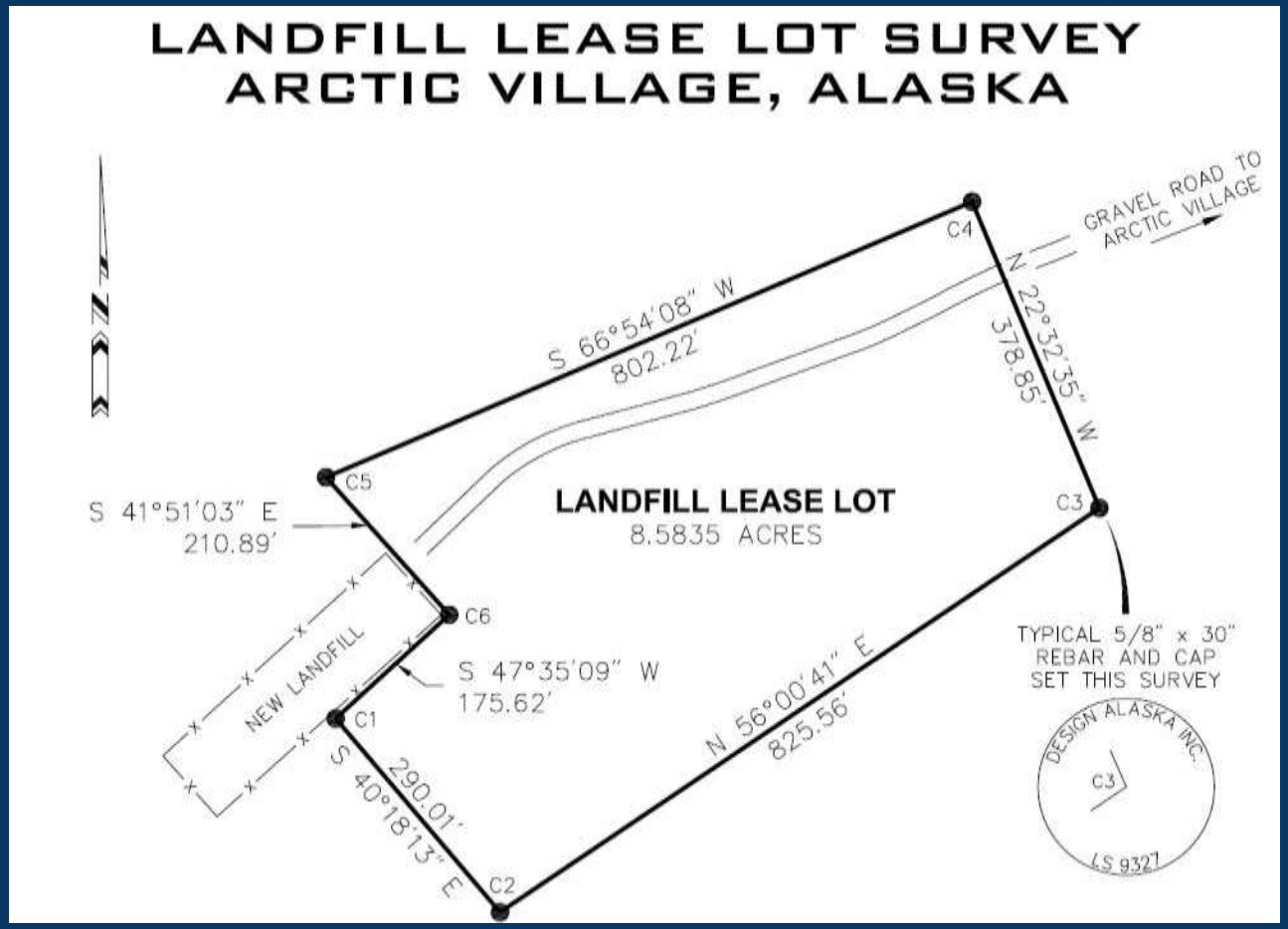
C C3.01 DEMOLISHED ACCESS ROAD SECTION (NORTH - SOUTH)

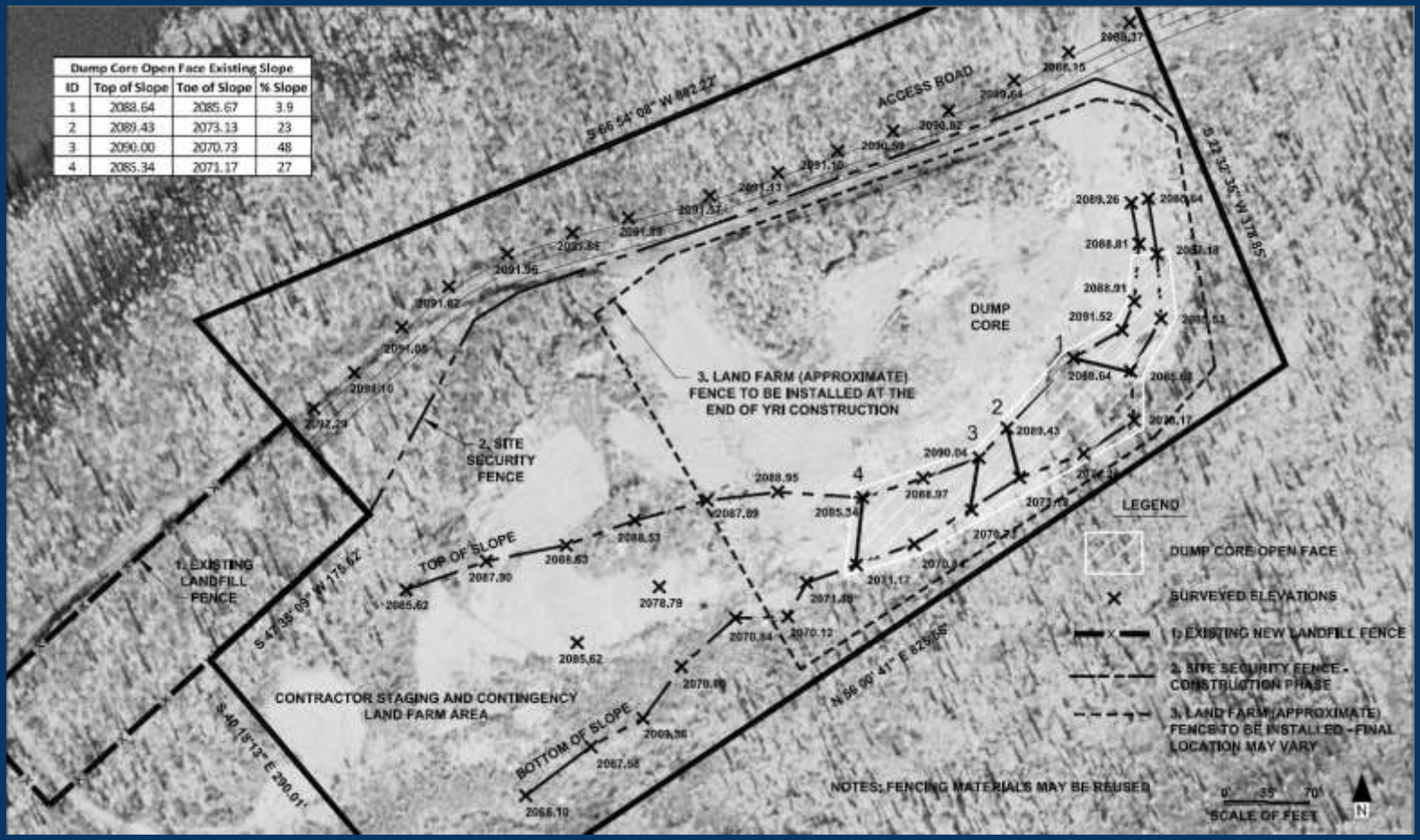
SCALE: NONE

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

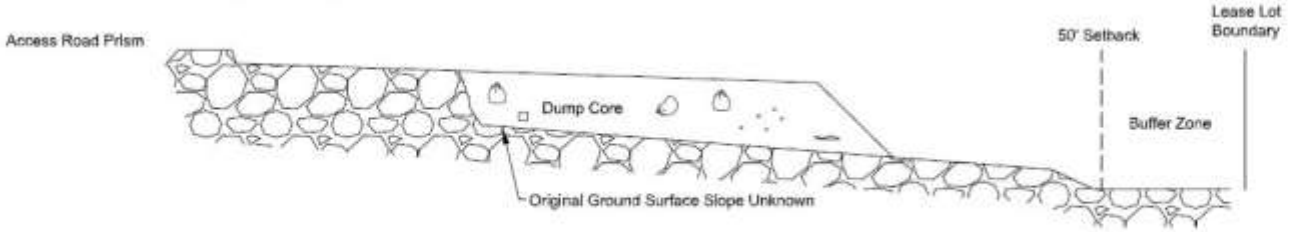
Arctic Village

Survey

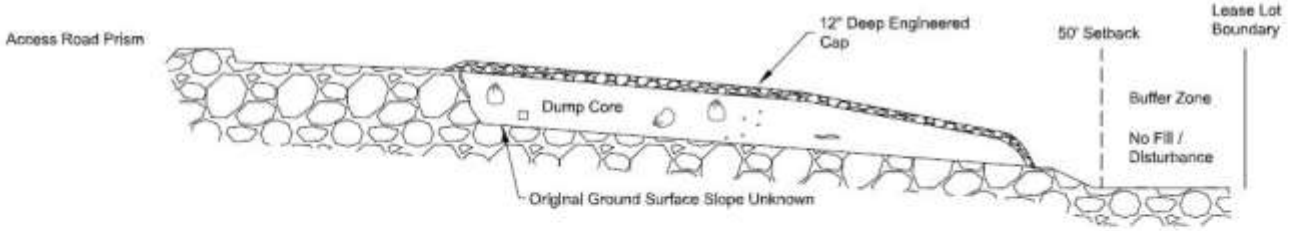

LANDFILL LEASE LOT SURVEY
ARCTIC VILLAGE, ALASKA
GRAVEL ROAD TO ARCTIC VILLAGE
C4
S 66°54'08" W
802.22'
N 22°32'35" W
378.85'
C5
S 41°51'03" E
210.89'
LANDFILL LEASE LOT
8.5835 ACRES
C3
C6
NEW LANDFILL
S 47°35'09" W
175.62'
C1
S 40°18'13" E
290.01'
N 56°00'41" E
825.56'
C2
TYPICAL 5/8" x 30" REBAR AND CAP SET THIS SURVEY
DESIGN ALASKA INC.
C3
LS 9327


Dump Core Open Face Existing Slope
ID | Top of Slope | Toe of Slope | % Slope
1 | 2088.64 | 2085.67 | 3.9
2 | 2089.43 | 2073.13 | 23
3 | 2090.00 | 2070.73 | 48
4 | 2085.34 | 2071.17 | 27
ACCESS ROAD
DUMP CORE
3. LAND FARM (APPROXIMATE) FENCE TO BE INSTALLED AT THE END OF YRI CONSTRUCTION
2. SITE SECURITY FENCE
1. EXISTING LANDFILL FENCE
TOP OF SLOPE
BOTTOM OF SLOPE
CONTRACTOR STAGING AND CONTINGENCY LAND FARM AREA
S 66° 54' 08" W 882.22'
S 22° 32' 35" W 176.95'
S 47° 38' 09" W 175.62'
S 40° 13' 13" E 290.01'
N 56° 09' 41" E 829.55'
LEGEND
DUMP CORE OPEN FACE
SURVEYED ELEVATIONS
1) EXISTING NEW LANDFILL FENCE
2. SITE SECURITY FENCE - CONSTRUCTION PHASE
3. LAND FARM (APPROXIMATE) FENCE TO BE INSTALLED - FINAL LOCATION MAY VARY
NOTES: FENCING MATERIALS MAY BE REUSED
0' 35' 70'
SCALE OF FEET
N

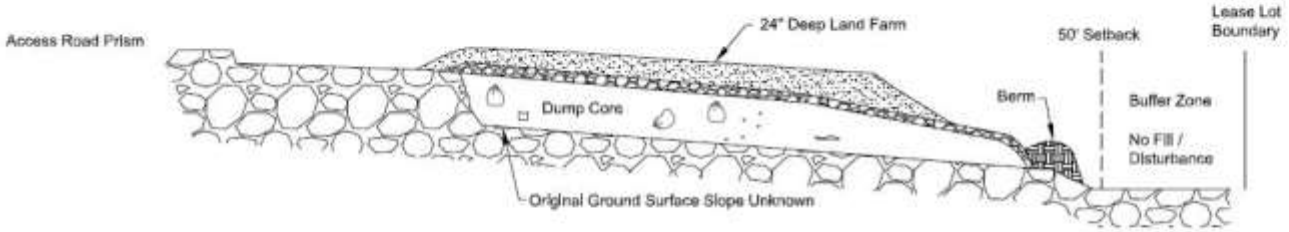
1. Existing - Refer to Figure 8 for elevations and additional slope information



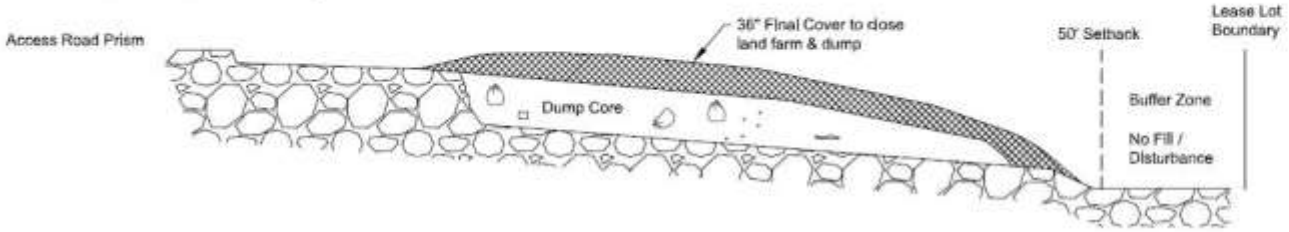
2. Dump/ Land Farm Base Site Preparation Phase & Engineered Cap & Interim Cover 18.AAC60.243



3. Land Farm Constructed/Dump Site Interim Cover



4. Land Farm Closure - Final Dump Closure Cover



Notes:
1. Dump Core Open Face up to 48% Slopes.

2. No more than 3:1 slope.
Graded to drain.

3. See general notes on Figure 2 regarding dump core surface conditions and land farm construction requirements.

4. Final cover 36" deep.
Compacted to prevent infiltration of runoff.
Seeded to revegetate.
Berm leveled / removed.

Legend

- Land Farm
- Clean Cap
- Waste
- Berm
- Final 36" closure cover

N

Photo 7: *Aerial view of dump closure cap, land farm, and permanent fence.*

Questions?