# I-1 GRAVEL PIT RECLAMATION

## *PURPOSE & APPLICATIONS*

Gravel pit reclamation is the stabilization of inactive borrow areas with herbaceous perennial plants. The purpose is to stabilize the soil, preventing wind or water erosion from causing on-site or off-site damage and to improve the aesthetic appeal and the ability of the site to support wildlife. This practice is applicable to sand and gravel borrow areas which have had the soil profile replaced to approximate original conditions or where the soil profile has been removed.

## *CONSIDERATIONS*

- Gravel pit reclamation provides an excellent opportunity to use recyclable organic residuals rather than mining topsoil from prime farmland areas.
- Gravel pits should be revegetated with a diversity of grasses, shrubs and trees to provide improved wildlife habitat.
- Nutrients and pesticides used to establish and maintain vegetation must be managed to protect surface and ground water quality.
- Late fall seeding may fail and cause water quality deterioration in spring runoff events.
- Sand and gravel pits are difficult sites to permanently vegetate. The difficulty can almost always be attributed to one factor: the topsoil is usually sold and is not stockpiled for reclamation. To re-establish vegetation, save enough topsoil on-site to allow for a 4-inch cap over the whole area. This is usually sufficient for establishing selected vegetation compatible with the site conditions.

## *SPECIFICATIONS*

### Engineering Considerations

Each site should be evaluated to determine if engineering practices are needed to help maintain soil stability and prevent erosion. While some sites require specific and detailed engineering plans, there are general guidelines that can be considered on all sites. The following guidelines can ease the task of establishing vegetation:

**Slope stability**: Cut and fill slopes should not exceed 2:1 (2 horizontal feet for 1 vertical foot) to provide stability. Flatter slopes (3:1) are preferred to facilitate seeding efforts.

**Slope length**: Avoid long slopes to help prevent erosion and to allow access for seeding, mulching, and maintenance. Refer to the LAND GRADING AND SLOPE PROTECTION BMP for information about modifying slope lengths.

**Diversions**: Construct diversions at tops of slopes to divert runoff away from the slope banks to a stable outlet. Refer to the WATER DIVERSION BMP.

**Chutes**: Construct rock lined chutes or equivalent to conduct concentrated flow of water to stable outlets. Refer to the RIPRAP REINFORCED WATERWAYS BMP or REINFORCED WATERWAYS BMP.

### Grass and Legume Species

### Preparation for Seeding

Remove large stones, boulders, and other debris that will hinder the seeding process and establishment of vegetation.

Spread a minimum depth of 4 inches of topsoil over the site; but topsoil substitutes may be used instead. The topsoil should be mixed with the subsoil to a depth of 6 inches minimum. This helps roots to penetrate into the less fertile subsoil and helps prevent slippage of the grass layer in the future.

Sample and test the topsoil: Obtain samples by collecting 6 to 8 small samples (1 or 2 handfuls) of soil material from the upper 4 inches of the area to be seeded. Mix the small samples to obtain one composite sample.

Use part of the sample for a soil test to determine lime and fertilizer needs. Run the balance of the sample(s) through a sieve analysis to determine the percent by weight passing a 200-mesh sieve. Sieve analyses can be requested from the University of Maine Soil Analytical Lab in Orono (581-2917).

**Seeding Procedures**

Select one of the following grass/legume mixes as described for gravel pits. These mixes are recommended because they are better adapted to gravel pit sites and require little maintenance during and after establishment. Additional guidance on species substitutes and available seed sources may be obtained from NRCS field offices and local Soil and Water Conservation Districts.

**MIX 1**

| SPECIES | VARIETY (select one) | Lb Per Acre |
|---|---|---|
| Switchgrass | Blackwell, Shelter, Cave-in-Rock | 4.0 |
| Big Bluestem | Niagara, Kaw | 4.0 |
| Little Bluestem | Camper, Aldous, Blaze | 2.0 |
| Sand Lovegrass | NE-27, Bend | 1.5 |
| Coastal Panicgrass | Atlantic | 2.0 |

**MIX 2**

| SPECIES | VARIETY (select one) | Lb Per Acre |
|---|---|---|
| Flatpea* | Lathco | 10.0 |
| Perennial Pea* | Lancer | 2.0 |
| Crownvetch* | Penngift, Chemug | 10.0 |
| Tall Fescue | Ky-31, Rebel, Ken-Hi | 10.0 |

**MIX 3**

| SPECIES | VARIETY (select one) | Lb Per Acre |
|---|---|---|
| Orchardgrass | Pennlate, Kay, Potomac | 5.0 |
| Tall fescue | Ky-31 | 10.0 |
| Redtop | Streeker, Common | 2.0 |
| Birdfoot trefoil | Viking, Empire | 5.0 |

* These legumes must be inoculated at time of seeding. If seeding by hand, use a sticking agent, such as cola or milk to stick inoculant to seed. If seeding with hydroseeder, use 4 times the recommended rate of inoculant.

Based on the percent weight passing a 200-mesh sieve, select one of the three grass/legume mixes described above. Use:

Mix 1: Where percent by weight passing a 200 sieve is less than 15
Mix 2: Where percent by weight passing a 200 sieve is between 15 and 20
Mix 1, 2 or 3: Where percent by weight passing a 200 sieve is above 20

***The standard soil conservation mix available from local suppliers is not recommended. This mix usually provides a green cover very quickly, but the plant species begin to die out in 2-4 years on sterile and droughty sites if fertilizing is not done on a regular basis.***

(b) The primary seeding dates begin as soon as the snow melts in the spring and ends May 15. The importance of early seeding cannot be overemphasized. Depending on weather conditions, substantial failure can be expected if seeding is done later.

Fertilize and lime based on soil test results.

**Tree and Shrub Species**

Gravel pits can be landscaped to provide screening and to improve wildlife habitat. This is especially important in larger pits where habitat has been lost. The following species can be used in gravel pit reclamation:

**Primarily for cover on sand and gravel sites**: Bristly locust, rugosa rose, seabuckthorn, and common juniper. Of these, bristly locust is the best where rapid spread and development is needed to provide cover on steep banks or gullies. Rugosa rose and seabuckthorn also spread by suckering, but are not as vigorous as bristly locust. Sweetfern can be used, if local transplant material is available. Overseeding shrub plantings with perennial ryegrass at 10 to 15 pounds per acre will provide some protection against erosion while the shrub planting is developing. Spacing of shrubs should be 4 feet x 4 feet, or 4 feet x 6 feet.

**Primarily for wildlife food and cover:** Use any of the above plants or crabapples, red osier dogwood, highbrush cranberry, sumac species, thornapple, and mountain ash.

**Primarily for screening:** Eastern red cedar, crabapples, European and Japanese larch, American arborvitea, red spruce, white spruce, Norway spruce, red pine and jack pine.

*Note: Avoid exotic invasive species including Autumn Olive, Russian Olive and Honeysuckle.*

## *MAINTENANCE*

Substantial stand vigor can be achieved if the site is topdressed with fertilizer one year after planting between June 15 and July 15. The timing of this topdressing is important. If mowing is desired to suppress woody growth, mow about mid-July leaving a stubble height of 6-8 inches. A good cover of flatpea will prevent invasion of woody species.