SPM Version 3 Orientation
Learning Exercise - Maintenance Provider
Answer Key

This exercise is intended to support your self-directed learning.

Start by reading SPM Section I- 4 of Volume 1 for an overview of the new layout.

You may wish to work with the digital version of the SPM, available at the following link: http://owrp.asttbc.org/p/documents.php

The 'paper' versions have a separate table of contents at the beginning of each of the four volumes. The digital version has those, plus a single table of contents covering all four volumes. The digital version table of contents have a 'click and go' feature, and it's helpful to use the 'Find' or 'Search' features.

To complete the exercise, first answer the questions, and then check the answer key - which is available at the SPM Learning Resources page: (http://owrp.asttbc.org/p/resources.php)

The correct answers are indicated in bold font.

1. Which volume of the SPM contains the glossary?
   - **a) I**
   - b) II
   - c) III
   - d) IV

2. Which volume of the SPM contains the guidelines?
   - a) I
   - b) II
   - **c) III**
   - d) IV

3. Which volume of the SPM contains the standards?
   - a) I
   - **b) II**
   - c) III
   - d) IV

4. Which volume of the SPM contains the rationale, references and a listing of design manuals?
   - a) I
   - b) II
   - c) III
   - **d) IV**

5. What is the section identifier for vertical separation standards?
   - a) 2 - 5
   - **b) II- 5.3**
   - c) IV- 5.8
   - d) 3.4.1.1
   - e) I- 4.4.1

6. What is the section identifier for vertical separation guidelines?
    a) I- 4.4.1
    b) IV- 5.8
    c) 2 - 5
    d) II- 5.3
    e) III- 5.3

7. Which pair of section identifiers refer to standards and guidelines for maintenance and monitoring frequency?
    a) I- 4.4.2 and III- 3.1
    b) II- 7.1 and III- 7.1
    c) IV- 5.5 and II- 5.5
    d) II- 3.8 and II- 4.2

8. Which section contains standards for treatment system monitoring?
    a) II- 7.1.3
    b) Table II- 2
    c) III- 6.4.3.2
    d) IV- 5.9.3 page IV- 22

9. Which section contains guidelines for watertight testing of tanks, including additional detail about procedures, alternative approaches and supporting information?
    a) II- 6.4
    b) Table II- 19
    c) III- 6.4.3.2
    d) IV- 5.9 page IV- 21

10. What is the section identifier for maintenance and monitoring standards?
    a) I- 4.4.2
    b) 2 - 7
    c) 2.4.2
    d) II- 7

11. What is the section identifier for maintenance and monitoring guidelines?
    a) I- 3.4
    b) IV- 7
    c) 4 - 7
    d) 3.3.3.4
    e) III- 7

12. What is the minimum required horizontal separation distance from a septic tank to a below ground water supply cistern?
    a) 3 m
    b) 7.5 m
    c) 15 m
    d) 30 m

13. What is the minimum required horizontal separation distance from a septic tank to a lake?
    a) 7.5 m
    b) 10 m
    c) 15 m
    d) 30 m

14. What is the minimum required horizontal separation distance from a BC zero discharge lagoon to an irrigation well?
    a) 3 m
    b) 7.5 m
    c) 15 m
    d) 30 m

15. For repair of an existing system, which of the following procedures requires a Filing submission to the Health Authority?
    a) replacement of transducer
    b) installation of new tank risers and lids
    c) extending trenches for additional area of infiltrative surface
    d) replacement of short sections of pipe when not functioning as intended

16. For repair of an existing system, which of the following procedures does not require a Filing submission to the Health Authority?
    a) replacement of D-box
    b) retrofitting treatment devices
    c) addition of grease interceptor
    d) upgrading trickle gravity to a pump to D-box configuration

17. What is the minimum initial frequency for flow monitoring of a type 2 system?
    a) 1 month
    b) 6 months
    c) 12 months
    d) 24 months

18. What is the minimum initial frequency for inspection by a maintenance provider of a type 3 system?
    a) 1 month
    b) 6 months
    c) 12 months
    d) 24 months

19. What is the minimum initial frequency for effluent sampling of a type 2 system?
    a) 1 month
    b) 6 months
    c) 12 months
    d) 24 months

20. To determine if wastewater is “typical residential sewage” the MP should compare sampling results to which TSS parameter guidelines?
    a) 35 - 60 mg/L
    b) 50 - 80 mg/L
    c) 175 - 400 mg/L
    d) 290 - 560 mg/L

21. What is the minimum vertical separation in native soil for gravity distribution when the percolation rate is 0.5 minutes per inch?
    a) 60 cm
    b) 90 cm
    c) 150 cm
    d) 183 cm

22. What is the minimum required residual pressure (squirt height) when using 3.2 mm (1/8 inch) orifices
    a) 60 cm
    b) 90 cm
    c) 150 cm
    d) 180 cm

23. The data record from a dosing control panel shows cycle count of 11,572. The maintenance plan lists the dose volume as 200 L. The previous maintenance was completed 760 days previously, and at that time the cycle count was 2492. What is the average daily flow since the last service?
    a) 1,195 L
    b) 2,389 L
    c) 9,080 L
    d) 1,816,000 L
    e) 2,314,400 L

24. The data record from a dosing control panel shows 3000 cycle counts over the previous 400 days. Dose volume is 300 L. DDF is 3000 L/day. Which of the following conclusions is accurate?
    a) usage is 150 % of the design capacity, the system is over loaded *(since the intended maximum flow usage is ½ of DDF, average flow allowance = ½ of DDF, DDF includes a peaking factor of 2x)*
    b) usage is 75 % of the design capacity, the system is not overloaded
    c) flow monitoring indicates the system is receiving groundwater infiltration
    d) flow monitoring indicates the system components were not sized in accordance with DDF

25. A lab analysis report of a sewage sample states that median cBOD5 was 700 mg/L, and median TSS was 500 mg/L. Which of the following conclusions is accurate?
    a) sewage characteristics are within the SSR definition for type 3
    b) cBOD5 are within acceptable standards and guidelines
    c) sewage strength is greater than "typical residential sewage" parameters
    d) oil and grease quantities exceed acceptable quantities for type 2 effluent

26. What is the minimum DDF for a 3 bedroom residence with 280 m^2 of living area?

Notes:
- *Refer to Table II- 8.*
- *The question does not indicate any information about projected occupancy so we will assume there will be less than 3.75 occupants per Table II- 9.*
- *The area does not exceed 280 m^2 per maximum from Table II- 8.*
- *Therefore, there are no extra allowances required.*

Answer: ***1300 L/day***

27. What is the minimum DDF for a 3 bedroom residence with 300 m^2 of living area and projected occupancy of 3 persons?

Notes:
- *Refer to Table II- 8 and Table II- 9.*
- *Projected occupancy does not exceed the Table II- 9 min. number of occupants so no extra allowance is required for that issue.*

- *The area exceeds the 280 m^2 maximum area for the 3 bedroom category. So additional DDF is required … an allowance for area exceeding the maximum floor area … an additional 3 L/d for each m^2 of area in excess of 280 m^2.*

Answer: 1300 L/day + 3 L/m^2 x (300 m^2 - 280 m^2) = ***1360 L/day***

28. What is the minimum DDF for a 5 bedroom residence with 400 m^2 and with anticipated occupancy of 8 persons?

Notes:
- *Refer to Table II- 8 and Table II-9.*
- *The question does indicate occupancy, which we should be checking in all cases and confirming with a signed owner's declaration.*
- *Table II- 9 lists a minimum number of occupants of 5.5 persons for a 5 bedroom residence. Don't be distracted by the 'partial person,' by the 0.5 issue. That approach simply allows us to use either Table II- 8 or Table II- 9 when occupancy is not unusually high, and arrive at a similar DDF. For example, if projected occupancy was 4 persons in a 5 bedroom house, we could use Table II- 9 to determine DDF as 5.5 persons x 350 L/day per person flow = 1925 L DDF, which is essentially the same as the 1900 L from Table II- 8. Or to look at it another way, it essentially means that if projected occupancy is greater than 5, then DDF will be calculated based on per person flow rates from Table II- 9, resulting in a higher DDF than the Table II- 8 allowance.*

Answer: 8 persons X 350 L/day = ***2800 L/day***

29. What is the minimum DDF for a sewerage system that will serve a 2 bedroom residence with 200 m^2 of living area and a secondary suite within a detached garage that has 1 bedroom and 55 m^2 of living area? Projected occupancy is 3 persons in the 2 bedroom primary residence and 2 persons in the 1 bedroom secondary residence.

Notes:
- *Refer to Table II- 8, Table II- 9 and section III- 5.1.2.4.*
- *When there are secondary residences of any type, whether detached or part of the primary structure, then the overall DDF must be the sum of DDFs for two distinct residences. For example, in this case the DDF is not 1300 L as per Table II- 8 for a 3 bedroom home, rather is the sum of DDFs for a 2 bedroom home and a 1 bedroom home. This would also be the case if the secondary suite was in the basement or above an attached garage.*

Answer: 1000 L/day + 700 L/day = ***1700 L/day***

30. What is the minimum DDF for a two story residence, where the upper floor has 3 bedrooms and 200 m^2 of living area, and a full basement (200 m^2) that is currently unfinished? The owner plans to finish the basement as a games room, exercise area, bar and a bathroom. Projected occupancy is no more than 3 persons.

Notes:
- *Refer to Table II- 8, Table II- 9 and section III- 5.1.2.1.*
- *Since the owner plans to finish the basement, it is clear that DDF should include an allowance for that use. However, it will not be a suite, rather just additional living area.*

Answer: 1300 L/day + 3 L/m^2 X (400 m^2 - 280 m^2) = ***1660 L/day***

31. What is the minimum DDF for a 5 bedroom residence with 480 m^2 of living area? The kitchen sink is equipped with a garburator. Projected occupancy is generally less than 5 persons.

Notes:

- *Refer to Table II- 8, Table II - 9 and sections II- 5.1.3.2 and III- 5.1.3.2.*
- *Garburators cause a significant increase in suspended solids in effluent. Therefore, tanks and treatment units, and the dispersal system are sized based on an increased DDF (at least by a factor of 1.5).*
- *So for purposes of sizing components, DDF from Table II- 8 or Table II- 9 is multiplied by 1.5.*
- *However, for flow monitoring purposes (and others) the relevant quantity is DDF before the increase.*
- *Therefore, the DDF reported on Health forms and other documented entries related to flow monitoring (maintenance plan) will be the DDF "before this increase."*
- *In this question, the living area exceeds the Table II- 8 maximum floor area, so an allowance is needed for that, as well as the 1.5 factor for the garburator.*

Answer: 1900 L/day + 3 L/m^2 X (450 m^2 - 420 m^2) = ***1990 L/day*** *for the 'basic' DDF (flow monitoring etc.) But for sizing components the DDF is increased by 50%, a 1.5 multiplier, 1990 L/day x 1.5 =* ***2985 L/day.***

32. What is the minimum DDF for a 90 m^2 cabin with an open floor plan (no bedrooms) used for approximately 60 days per year by 5 persons?

Notes:

- *Refer to Table II- 9 and sections III- 3.1.1, III- 3.1.2, III- 3.1.5 and III- 5.1.2.3.*
- *Base your assessment on consultations with the owner and a signed owner's declaration.*
- *If you determine that the structure and use is within the guidance and definition of "seasonal cottage" then use the Table II- 9 DDF per person flow allowance for the seasonal cottage category (250 L/day/person), AND inform the owner of their responsibilities under the SSR, AND consider the severity of site and soil constraints such as proximity to freshwater bodies, etc., AND research any local bylaws or other regulatory requirements. Often, it is NOT appropriate to use the minimum DDF.*
- *Being 'willing' to increase DDF is especially important when high occupancy/peak flows are likely, and/or when performance boundaries are significant (for example, a lake located downslope with sandy soils over a shallow restrictive horizon). Increasing DDF will generally provide greater assurance of adequate treatment performance. Also, increasing DDF and the corresponding size of the dispersal system is the cheapest way to increase system longevity.*

Answer: 5 persons X 250 l/day = ***1250 L/day minimum DDF***

33. What is the minimum DDF for a 2 bedroom mobile home with 67 m^2 floor area and projected occupancy of 3 persons?

Notes:

- *Refer to Table II- 8, Table II- 9 and sections III- 5.1.2.5., III- 3.1.1, III- 3.1.2, and III- 3.1.5.*
- *Consider the likelihood of future additional floor area and/or occupancy exceeding 3 persons. Note from III- 5.1.2.5.(a), "increase the number of occupants if there is doubt."*

Answer: 3 persons X 300 l/day = ***900 L/day minimum DDF.***

34. What is the minimum required VS for gravity distribution of type 2 effluent to coarse sand?
Notes:
- *Refer to Table II- 14.*

Answer: ***150 cm***

35. Determine the minimum required VS, given the following conditions:
- uniform distribution
- demand dosing
- dose frequency of 6 times per day based on DDF
- type 2 effluent, type 2 HLR
- soil texture is loamy sand at the infiltrative surface and at least 30 cm below

The minimum required VS in native soil is _____ (fill in the blank).

Notes:
- *Refer to Table II- 10, and Table II- 15.*
- *To determine VS, there are different tables for different types of distribution and different rows for type of dosing and type of effluent HLR. Determination of the minimum VS depth standard requires a 'two pronged approach.' In general, it requires first looking at the dosing frequency tables (Table II - 10, 11 and 12) and then looking at the distribution type tables (Table II- 14, 15, 16, 17, and 18).*
- *In this example, Table II- 10 determines that the proposed dosing is within the 'low' dosing category. Table II- 15 lists the VS standard of 90 cm.*

Answer: ***90 cm***

36. Determine the minimum required VS, given the following conditions:
- uniform distribution
- timed dosing
- dose frequency of 10 times per day based on DDF
- type 1 effluent, type 1 HLR
- soil texture is loamy sand at the infiltrative surface and at least 30 cm below

The minimum required VS in native soil is _____

and the minimum as constructed VS is _____ (fill in the blanks).

Notes: Refer to Table II- 11, and Table II- 16.

Answer: The minimum required VS in native soil is ***45 cm*** and the minimum as constructed VS is ***60 cm.***

37. Determine the minimum required VS, given the following conditions:
- uniform distribution
- demand dosing
- dose frequency of 14 times per day based on DDF
- type 2 HLR
- soil texture is loamy sand at the infiltrative surface and at least 30 cm below
- sand media will not be used … is not a practical option due to high transport costs

The minimum required VS is _____.

Notes:

- *Refer to Table II- 10, Table II- 15 and the notes to Table II- 15 and 16 on page II- 28.*
- *"Confirm that the vertical separation, as planned, meets both the minimum depth of native soil specified (in column 4)* ***and*** *the minimum required total depth of soil plus sand (as constructed VS, column 5)."*
- *Table II- 15 indicates 60 cm VS in native soil, and 85 cm as constructed VS, but since adding sand media to increase the total depth will not be an option, VS in native soil must be equal to or greater than the as constructed VS standard.*

Answer: ***85 cm****.*

38. Determine the minimum required VS and sand media thickness, given the following conditions:
    - sand mound dispersal system (must be uniform distribution, gravity dispersal not allowed)
    - the depth of unsaturated and permeable native soil above seasonal high water table is 30 cm
    - demand dosing
    - dose frequency of 11 times per day based on DDF
    - type 1 HLR is used for sizing the mound sand infiltrative surface (a type 2 HLR is used for the basal loading area check)

The standard for minimum required as constructed VS is _____ and …
the minimum sand media thickness is _____ …
the depth of suitable soil above a limiting condition is _____ …
therefore, the as constructed VS will have to be at least _____.

Notes:

- *Refer to Table II- 10, Table II- 17 and the note to Table II- 17.*
- *"Confirm that the vertical separation, as planned, meets the minimum depth of native soil specified (in column 4)* ***and*** *the minimum depth of sand (sand media thickness, column 5)* ***and*** *the minimum required total depth of soil plus sand (as constructed VS, column 6)."*
- *85 cm as constructed VS standard - 30 cm native soil depth = 55 cm sand media depth, but the required minimum sand media thickness is 60 cm … therefore the infiltrative surface will be placed at least 90 cm above the limiting condition resulting in 90 cm of as constructed VS.*

Answer: The standard for minimum required as constructed VS is ***85 cm****, the minimum sand media thickness is* ***60 cm****, the depth of suitable soil above a limiting condition is* ***30 cm*** *therefore the as constructed VS will have to at least* ***90 cm****.*

39. The depth of permeable, unsaturated soil within a proposed dispersal area is 180 cm. Soil texture is loamy sand. What is the maximum depth from surface to trench bottom (i.e. how deep can the trench be) that will achieve VS standards for gravity dispersal trenches?

Notes:

- *Refer to Table II- 14 and section III- 5.3.2.1.*
- *SPM page III- 64 says: "If soil depth is limited, the infiltrative surface can be placed higher in the soil ("shallow placement"), at the surface ("at grade") or elevated above the surface on a layer of sand media fill ("above grade" or "raised").*
- *180 cm depth of suitable native soil - 150 cm VS standard = 30 cm maximum depth of infiltrative surface/bottom of trench.*

Answer: ***30 cm***

40. The native soil has a texture of loam, with 90 cm depth to a restrictive layer of clay loam. A type 1 pressure dispersal system is proposed, with demand dosing at 4 doses per day. What is the required elevation relative to original grade of the infiltrative surface (i.e. how deep?), to meet the minimum VS standards?

Notes:

- *Refer to Table II- 10 and Table II- 15, and section III- 5.3.2.1.*
- *90 cm depth of suitable native soil - 70 cm VS standard = 20 cm maximum depth of infiltrative surface (depth of trench or bed).*

Answer: ***20 cm***

41. Answer the questions that follow, given the following conditions:

- the configuration of the dispersal system will achieve better than 10% variation in effluent volume applied to each 0.5 sq m portion of the dispersal trenches
- DDF is 2500 L/day
- the dosing system will achieve consistent flow equalization throughout the day
- the volume of each dose will be 155 L per dose
- a type 2 HLR will be used to determine the area of infiltrative surface
- soil texture is sandy loam to a depth of 120 cm, with wet clay under that
- a 10 cm deep blinding layer of mound sand will be used to prevent crusting or "capping".

a) Is the dosing characterized as 'normal' or 'low'?

b) Which VS Table applies (Table II- 14, 15, 16, 17 or 18)?

c) What is the minimum VS in native soil?

d) What is the minimum as constructed VS?

e) What is the maximum depth of the dispersal trench that will achieve VS standards?

Notes:

- *Refer to II- 5.2.1, II- 5.2.1.1, II- 5.2.2, II- 5.3, and III- 6.5.2.1.(e).*
- *The system 'qualifies' as uniform distribution (each 0.5 sq m gets even distribution) with timed dosing, not micro dosing (2500 L DDF ÷ 155 L/dose = 16 doses per day), the relevant row from Table II- 11 is 'other soils', dosing is 'normal', Table II- 16 applies since there will be less than 30 cm sand media used, the relevant row from Table II- 16 is 'other soils', the timed dosing row applies (since 'normal' dosing is applicable, not low or micro), so the standards are 45 cm native VS and 60 cm as constructed.*
- *The blinding layer "may be considered as part of the required native soil separation" as per the notes to Table II- 15. Therefore, the maximum depth of the trench is … 120 cm depth of suitable soil - 60 cm min. as constructed VS + 10 cm depth of blinding layer = 70 cm below original grade. This meets and exceeds the min. 45 cm native soil VS and the min. 60 cm as constructed VS (50 cm native soil plus the 10 cm blinding layer) … so trench depth can be max 70 cm below original grade, with 10 cm blinding layer added, placing the infiltrative surface at 60 cm.*

Answer:

a) ***normal***
b) ***Table II-16***
c) ***45 cm***
d) ***60 cm***
e) ***70 cm***

For the remaining portion of the exercise, refer to III- 7 Maintenance Guidelines. The 'questions' are direct quotes from the SPM. Fill in the blanks with the SPM text.

42. The Volume II standards show the minimum intervals for initial maintenance and testing. Start with frequent maintenance, sampling and testing. Then, based on the results of the first year, and on a discussion between the AP who filed the system and the maintenance provider, develop a new maintenance and sampling frequency for the next five to ten years … As a guideline, maintenance and testing frequency should be at minimum:
    - Every _____**5**_____ years for gravity dispersal Type 1 systems and BC zero discharge lagoons.
    - Every _____**2**_____ years for other systems, including ET and ETA beds.

43. After maintaining the system, provide the owner or client a **written** report. In the report include at least the following:
    - Describe if the system is being used in a manner consistent with its **design capacity** and condition.
    - An evaluation of the system's **current performance** summarizing the results of the maintenance service and monitoring in layman's terms, and making conclusions about system **operation and malfunction**.
    - A listing of monitoring data such as **cycle counts**, pump run time, pump run amperage, **alarm events** and any other flow or performance data provided by the **pump control panel, flow meter, cycle counters** or other monitoring features.
    - **Squirt** heights for pressure systems, **pressures** for drip systems …
    - A list of **recommended repairs** or improvements …

44. **ASTTBC** has established guidelines which include terminology to be used to describe conclusions about system condition and performance. **Use this terminology** when reporting on system maintenance.

45. Take **photographs** to document maintenance and maintenance inspection.

46. For the first maintenance service …
    - Determine the **number of occupants or users**, and compare this to the **design capacity** of the system.
    - Check for **leaking plumbing fixtures** that cause unnecessary **flow volume.**
    - Check the property for any **drainage systems** such as **interceptor drains**, retaining wall footing drains, surface drainage, etc., and assess the potential impact on the wastewater system.

- Check to ensure that no discharges reach the system from any groundwater or surface water drainage system, such as **roof water or foundation drains**, catch basins, **driveway grates**, etc.
- Conduct a **flow test** to confirm that all flows, from every plumbing fixture (including from any secondary buildings), **arrive** at each component of the onsite system in **a correct manner**.

47. Regarding minimum scope of maintenance … at each maintenance service, in addition to any specific provisions in the **maintenance plan:**
    - Examine, test, and document the condition and performance of the **entire system** including the **soil dispersal** system.
    - If **media** is used in treatment systems such as sand filters, any packed bed filter, CTDS, or any other products using proprietary media – assess the condition and serviceability of **the media** and determine when the media should be **replaced**.
    - Carry out any maintenance and monitoring tasks as **prescribed** by the **maintenance plan** as filed.
    - If backups of the dispersal system are observed, use a **pipe camera** to check for structural damage or **clogging** of the piping system.

48. Regarding repair work by maintenance providers … **Minor repairs**, and replacement of some components, can be included within the scope of maintenance. However, **major repairs**, alterations, or replacement of major components, fall outside the scope of maintenance. Major repairs require **a Filing**, and must only be carried out by APs that have been qualified and accredited to **plan or install** systems. See Section **II- 2.1.1**.

49. General maintenance tasks include:
    - Confirmation of suitable **access provisions** to facilitate ongoing maintenance and monitoring…
    - Confirmation of continuing safety provisions, including, but not limited to, secure **tank lids**, and **prevention of contact with electrical** components and junctions.
    - Examine electrical connections and components for **corrosion** and general condition and safety. Check for proper **sealing of conduit** and components to prevent **passage of gases or moisture**.
    - Check **records of flow**. Compare this data to records of commissioning or previous maintenance; calculate the **actual average flows** since the last record; and compare to the average flow allowance (**50% of DDF**) over the intervening period.
    - Examine, test, and document the condition and performance of the **entire system** including the **soil dispersal** system.

- If **media** is used in treatment systems such as sand filters, any packed bed filter, CTDS, or any other products using proprietary media – assess the condition and serviceability of **the media** and determine when the media should be **replaced**.

50. For maintenance of septic tanks:
    - Examine the **inlet and outlet baffles** in the septic tank for proper configuration, condition, alignment, and blockages.
    - Check for **leaks**, and evidence of settling of the tank or **settling or misalignment** of the inlet or outlet piping.
    - Check for flows arriving in the septic tank in a consistent manner without surging or 'gurgling', which could indicate **bowed**, damaged, or **clogged** sewer lines.
    - Check for **trickle flows** entering the septic tank when no water fixtures are running. This may indicate **groundwater infiltration** into the tank, or a **leaking fixture** in the building.
    - Pump out when … total solids accumulations are **more than 1/3** of the internal height of the tank …

51. For maintenance of sewage treatment systems, and for CTDS …
    - Confirm proper operation of (as applicable) **air blowers**, and **re-circulating pumps**.
    - Examine and clean **UV bulbs** and related hardware. UV bulbs should typically be replaced every **12 months**.
    - Sample and test the **effluent quality**, as directed by the **maintenance plan**. If there is no plan, then test the effluent following the minimum interval standards of Section Error! R eference source not found..
    - If it is time to replace the media, then check that the media is **disposed of in a safe manner** that minimizes health risks. Arrange disposal at a waste handling facility that is **approved by the Ministry of Environment.**

52. For maintenance of dispersal systems …
    - Observe the dispersal system for evidence of **surfacing effluent**, excessive settling, or soil or sand erosion. Confirm appropriate **vegetative cover**.
    - Examine all **observation ports** in the dispersal area, and assess any **liquid levels** found.
    - **Flush, jet, or vacuum** clean any plugged laterals.
    - Perform a **residual pressure test** and record distal pressure (**squirt height**). Compare this to the **commissioning record**, and to previous maintenance records.
    - Flush the system. If the force main has cleanout(s), then isolate all laterals, and then **flush the force main first**. Next, use the lateral isolation **valves** to increase the **scouring velocity** by directing the full pump flow to **each lateral individually**.

53. For maintenance of drip systems …
    - Inspect and hand clean the **fine filter(s)**.
    - Open the field flush valves and **manually flush** the system.
    - Check **system pressures**, and compare the pressures to the **baseline data** from commissioning records.
    - Inspect and clean the **air valve/vacuum breakers**, and confirm proper operation. Consider **regular replacement**.

54. For maintenance of dosing systems and controls …
    - Check that the **high level or other alarm(s)** are in working order.
    - Check that **float switches** are performing properly.
    - Visually inspect the control panel box for water tightness, **condensation or corrosion.**
    - Record the **counter and pump run time** information, and analyse this to determine the **system flows**.

55. And finally … from the SSR, what is the required setback from a septic tank or pump chamber to a drinking water well?

Answer: **30 m**