Disinfection Problems

1. You are required to disinfect an 18 inch diameter well with sodium hypochlorite. The well is 160 feet deep and static water level is 90 feet. How many gallons of a 5% chlorine solution should be added to the well to produce an initial dose of 100 mg/L?

2. You are required to disinfect a 15 inch diameter well with sodium hypochlorite. The well is 200 feet deep and static water level is 110 feet. How many gallons of a 10% chlorine solution should be added to the well to produce an initial dose of 100 mg/L?

3. You are required to disinfect an 18 inch diameter well with sodium hypochlorite. The well is 220 feet deep and static water level is 150 feet. How many gallons of a 12% chlorine solution should be added to the well to produce an initial dose of 100 mg/L?
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4. You are required to disinfect a 12 inch diameter well with sodium hypochlorite. The well is 150 feet deep and static water level is 100 feet. How many gallons of a 5% chlorine solution should be added to the well to produce an initial dose of 100 mg/L?

5. You are required to disinfect a 6 inch diameter well with sodium hypochlorite. The well is 130 feet deep and static water level is 70 feet. How many gallons of a 5% chlorine solution should be added to the well to produce an initial dose of 100 mg/L?

6. You are required to disinfect an 18 inch diameter well with sodium hypochlorite. The well is 180 feet deep and static water level is 120 feet. How many gallons of a 10% chlorine solution should be added to the well to produce an initial dose of 100 mg/L?
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7. Your crew has just installed a 12 inch diameter water main that is 700 feet long. It needs to be disinfected with an initial chlorine dose of 400 mg/L. How many gallons of a 5.25% solution of sodium hypochlorite will be needed?

8. Your crew has just installed a 10 inch diameter water main that is 500 feet long. It needs to be disinfected with an initial chlorine dose of 400 mg/L. How many gallons of a 5% solution of sodium hypochlorite will be needed?

9. Your crew has just installed an 18 inch diameter water main that is 450 feet long. It needs to be disinfected with an initial chlorine dose of 400 mg/L. How many gallons of a 10% solution of sodium hypochlorite will be needed?
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10. Your crew has just installed a 12 inch diameter water main that is 1,000 feet long. It needs to be disinfected with an initial chlorine dose of 400 mg/L. How many gallons of a 12.5% solution of sodium hypochlorite will be needed?

11. Your crew has just installed an 18 inch diameter water main that is 750 feet long. It needs to be disinfected with an initial chlorine dose of 400 mg/L. How many gallons of a 15% solution of sodium hypochlorite will be needed?

12. Your crew has just installed a 12 inch diameter water main that is 625 feet long. It needs to be disinfected with an initial chlorine dose of 400 mg/L. How many gallons of a 5% solution of sodium hypochlorite will be needed?
Disinfection Problems

13. A water storage tank has been out of service for inspection by divers. Prior to putting it back in service, it must be disinfected. The plan is to start with an initial chlorine dose of 100 mg/L for 24 hours. How many gallons of 12% sodium hypochlorite will be required if the tank is 35 feet in diameter and water level is 10 feet deep?

14. A water storage tank has been out of service for inspection by divers. Prior to putting it back in service, it must be disinfected. The plan is to start with an initial chlorine dose of 100 mg/L for 24 hours. How many gallons of 10% sodium hypochlorite will be required if the tank is 30 feet in diameter and water level is 8 feet deep?

15. A water storage tank has been out of service for inspection by divers. Prior to putting it back in service, it must be disinfected. The plan is to start with an initial chlorine dose of 100 mg/L for 24 hours. How many gallons of 12% sodium hypochlorite will be required if the tank is 35 feet in diameter and water level is 12 feet deep?
Disinfection Problems

16. A water storage tank has been out of service for inspection by divers. Prior to putting it back in service, it must be disinfected. The plan is to start with an initial chlorine dose of 100 mg/L for 24 hours. How many gallons of 12.5% sodium hypochlorite will be required if the tank is 25 feet in diameter and water level is 15 feet deep?

17. A water storage tank has been out of service for inspection by divers. Prior to putting it back in service, it must be disinfected. The plan is to start with an initial chlorine dose of 100 mg/L for 24 hours. How many gallons of 10% sodium hypochlorite will be required if the tank is 30 feet in diameter and water level is 10 feet deep?

18. A water storage tank has been out of service for inspection by divers. Prior to putting it back in service, it must be disinfected. The plan is to start with an initial chlorine dose of 100 mg/L for 24 hours. How many gallons of 12% sodium hypochlorite will be required if the tank is 45 feet in diameter and water level is 15 feet deep?
Disinfection Problems

19. Determine the chlorine dose in milligrams per liter if 100 gallons of a 5% sodium hypochlorite solution were used to disinfect 1.8 million gallons of water.

20. Determine the chlorine dose in milligrams per liter if 170 gallons of a 2.5% sodium hypochlorite solution were used to disinfect 2 million gallons of water.

21. Determine the chlorine dose in milligrams per liter if 150 gallons of a 5% sodium hypochlorite solution were used to disinfect 1.2 million gallons of water.

22. Determine the chlorine dose in milligrams per liter if 200 gallons of a 2% sodium hypochlorite solution were used to disinfect 3 million gallons of water.

23. Determine the chlorine dose in milligrams per liter if 120 gallons of a 5% sodium hypochlorite solution were used to disinfect 1.8 million gallons of water.

24. Determine the chlorine dose in milligrams per liter if 140 gallons of a 5% sodium hypochlorite solution were used to disinfect 1 million gallons of water.
Disinfection Problems

25. A well delivers 225 gallons per minute during normal system operation. What should the chlorine feed rate be in pounds per day if the desired dose is 2.0 mg/L?

26. A well delivers 200 gallons per minute during normal system operation. What should the chlorine feed rate be in pounds per day if the desired dose is 2.2 mg/L?

27. A well delivers 75 gallons per minute during normal system operation. What should the chlorine feed rate be in pounds per day if the desired dose is 2.1 mg/L?

28. A well delivers 25 gallons per minute during normal system operation. What should the chlorine feed rate be in pounds per day if the desired dose is 1.8 mg/L?

29. A well delivers 400 gallons per minute during normal system operation. What should the chlorine feed rate be in pounds per day if the desired dose is 2.0 mg/L?

30. A well delivers 300 gallons per minute during normal system operation. What should the chlorine feed rate be in pounds per day if the desired dose is 2.5 mg/L?
Disinfection Problems

31. Calculate the chlorine demand for water in milligrams per liter if the dose was 2.7 mg/L and the residual is 0.6 mg/L.

32. Calculate the chlorine demand for water in milligrams per liter if the dose was 2.8 mg/L and the residual is 0.4 mg/L.

33. Calculate the chlorine demand for water in milligrams per liter if the dose was 2.5 mg/L and the residual is 0.5 mg/L.

34. Calculate the chlorine demand for water in milligrams per liter if the dose was 2.1 mg/L and the residual is 0.6 mg/L.

35. Calculate the chlorine demand for water in milligrams per liter if the dose was 2.4 mg/L and the residual is 1.1 mg/L.

36. Calculate the chlorine demand for water in milligrams per liter if the dose was 2.7 mg/L and the residual is 1.2 mg/L.
Disinfection Problems

37. If a hypochlorite container is 3 feet in diameter, how many gallons were pumped if level drops 2 feet?

38. If a hypochlorite container is 3 feet in diameter, how many gallons were pumped if level drops 1.5 feet?

39. If a hypochlorite container is 3.5 feet in diameter, how many gallons were pumped if level drops 1.0 feet?

40. If a hypochlorite container is 3 feet in diameter, how many gallons were pumped if level drops 1.3 feet?

41. If a hypochlorite container is 3 feet in diameter, how many gallons were pumped if level drops 10 inches?

42. If a hypochlorite container is 2.5 feet in diameter, how many gallons were pumped if level drops 16 inches?
Disinfection Problems

43. Determine the ideal hypochlorite strength (in percent) of a solution that is pumped by a hypochlorinator at a rate of 90 gallons per day when the water being treated requires 12 pounds per day.

44. Determine the ideal hypochlorite strength (in percent) of a solution that is pumped by a hypochlorinator at a rate of 80 gallons per day when the water being treated requires 10 pounds per day.

45. Determine the ideal hypochlorite strength (in percent) of a solution that is pumped by a hypochlorinator at a rate of 70 gallons per day when the water being treated requires 11 pounds per day.

46. Determine the ideal hypochlorite strength (in percent) of a solution that is pumped by a hypochlorinator at a rate of 50 gallons per day when the water being treated requires 9 pounds per day.
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47. Determine the ideal hypochlorite strength (in percent) of a solution that is pumped by a hypochlorinator at a rate of 90 gallons per day when the water being treated requires 8 pounds per day.

48. Determine the ideal hypochlorite strength (in percent) of a solution that is pumped by a hypochlorinator at a rate of 75 gallons per day when the water being treated requires 12 pounds per day.

49. How many gallons of water must be added to 12 gallons of a 5.25% hypochlorite solution to produce a 2% solution?

50. How many gallons of water must be added to 10 gallons of a 10% hypochlorite solution to produce a 5% solution?
Disinfection Problems

51. How many gallons of water must be added to 5 gallons of a 5% hypochlorite solution to produce a 2% solution?

52. How many gallons of water must be added to 8 gallons of a 5% hypochlorite solution to produce a 1% solution?

53. How many gallons of water must be added to 2 gallons of a 10% hypochlorite solution to produce a 1.5% solution?

54. How many gallons of water must be added to 20 gallons of a 5% hypochlorite solution to produce a 2.5% solution?